Industrial Discharges in the Ley Creek Sanitary District:

Interim Report,

Onondaga Lake Watershed, Onondaga County, New York

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MRS. FLATTERY:

CALLED JOHN HENNIGAN'S OFFICE AND LEFT WORD FOR HIM TO BRING A COPY OF THE ROY WESTON REPORT.

THE ATTACHED REPORT (BELONGING TO MR. MEIXELL) IS AN INTERIM REPORT AND MR. MEIXELL DID NOT KNOW WHETHER THERE WERE ANY SUBSEQUENT REPORTS TO THIS.

(PLEASE RETURN THIS COPY TO MR. MEIXELL) (CALL ME AND I WILL PICK IT UP. Ext. 7551.)

SUMMARY

A total of 139 individual industries located in the Ley Creek portion of the Onondaga Lake Watershed were surveyed as part of an overall study of joint municipal-industrial waste treatment in this area. Of the industries visited, 19 were considered to have potential wastewater problems requiring sampling.

Included in this Interim Report are individual reports on each of the industries visited. Each report contains a brief outline of manufacturing processes, a description of wastewater production and disposal, and recommendations of wastewater management procedures.

The overall wastewater survey indicated that industrial organic pollution consisted in large part (80-90%) of the discharge from Bristol Laboratories. Bristol Laboratories contributes approximately 50 percent of the total organic load received at the Ley Creek Sewage Treatment Plant. Unacceptable concentration levels of metals and cyanides were being discharged by various plating operations although no toxicity problem could be readily demonstrated in the Ley Creek Sewage Treatment Plant Influent.

The Crouse Hinds Company and Syracuse China Corporation were found to discharge unacceptable levels of pollutants directly to Ley Creek.

Industrial Discharges in the
Ley Creek Sanitary District

Interim Report

Onondaga Lake Watershed
Onondaga County, New York

INTRODUCTION

GENERAL

The Ley Creek Sanitary District and extensions, outlined in Drawing B-1, nominally parallels the drainage area of Ley Creek, one of the major tributaries of Onondaga Lake. The Lake and its watershed is located in Onondaga County, New York. Encompassed within the Ley Creek Sanitary District is the greatest fraction of the industries in and around the City of Syracuse, New York. The remainder of the industries in the Syracuse area are located either within the Metropolitan Syracuse Sanitary District or in adjacent districts.

The majority of the industries as well as residents within the Ley Creek Sanitary District discharge wastewater to the Ley Creek Sewage Treatment Plant (as shown on Drawing B-1). Effluent from this secondary treatment plant discharges into Ley Creek.

Onondaga County in December 1966 applied to the Federal Water Pollution Control Administration for a research and development grant to demonstrate the feasibility and practicality of joint municipal-industrial waste treatment in the Onondaga Lake watershed. Subsequently, FWPCA Contract No. WPRD 66-01-68 was awarded.

SCOPE AND OBJECTIVES

As a portion of the Onondaga Lake Watershed study, Onondaga County retained ROY F. WESTON to first determine the present state of industrial discharges within the Ley Creek Drainage Area and subsequently to develop a master plan of wastewater collection and treatment in this area. The scope of the wastewater survey as contained in Contract No. P-112 dated February 13, 1968, between Onondaga County and ROY F. WESTON and as expanded in the Memorandum of Scope of Investigations submitted by ROY F. WESTON on March 22, 1968, is summarized below.

1. Conduct industrial plant interviews including wastewater sampling where appropriate.
2. Evaluate industrial wastewater management programs with recommendations pertinent to potential in-plant changes, potential by-product recovery, improvements in on-site waste control programs, and the need for on-site pretreatment of wastewaters.
3. Prepare an Interim Report containing the results of the industry visits in regard to the quantity, quality and point of discharge of wastewaters, potential in-plant changes, potential recovery of by-products, and potential up-grading of waste treatment facilities.

WASTEWATER QUANTITIES AND CHARACTERISTICS

GENERAL BASIS OF DATA

The wastewater survey basically was comprised of two phases; industrial interviews and a sampling and analysis program. In preparation for the industrial interviews, a list of 139 industries either served by the Ley Creek Sewerage System or within the drainage area of Ley Creek was obtained from Onondaga County. This list was based on information provided in *Directory of Manufacturers and Products - 1965* prepared by the Manufacturers Association of Syracuse.

Each industry was asked to cooperate in the wastewater survey and was notified of the type of information which would be requested in the interview. Subsequently, the industries were visited, the production facilities toured and wastewater handling facilities inspected. At the conclusion of this preliminary visit, a memorandum was prepared describing the wastewater problem and indicating the need for sampling and analysis. Each industry visited was sent a letter expressing appreciation for their cooperation and informing them of future sampling and analysis plans.

Prior to the inception of the industrial sampling and analysis program, a random grab sampling survey of the Ley Creek Sewage Treatment Plant influent was conducted. The purpose of this sampling was to obtain an estimate of the magnitude of the problem and to prepare baseline figures for use in determining the significance of individual industrial waste discharges. Forty two random grab samples were collected during the period from 6/13/68 through 6/20/68 and were analyzed for 5-day and ultimate carbonaceous Biochemical Oxygen Demand (BOD_5, BOD_{UC}), Chemical Oxygen Demand (COD), suspended solids (SS), volatile suspended solids (VSS), pH, acidity or alkalinity, phenols, oil and grease, cyanide (CN), phenol, chromium (Cr), copper (Cu), nickel (Ni), cadmium (Cd), zinc (Zn), ammonia (NH_3), organic nitrogen (TON), orthophosphate ($O\text{-}PO_4$), and total phosphate ($T\text{-}PO_4$).

INDUSTRIAL SAMPLING AND ANALYSIS

The industrial sampling and analysis survey was based on the premise that samples would be collected from all industries fulfilling any of the following criteria: 1) major industry not presently included in the Ley Creek Sewerage System, 2) industry with significant potential toxicity problems, i.e., metals, cyanides, phenols, and 3) industry whose organic load was considered to be a significant fraction of the present Ley Creek Treatment Plant organic load. The information obtained in the sampling and analysis survey would be used

to assess the contribution of each sampled industry to the wastewater treatability problem in the Ley Creek Drainage Area and also to provide information helpful to the individual industries' waste management program.

Grab and composite (up to 24 hours) samples were collected from the selected industries. Flows over the sampling period were obtained by water meter readings, lithium dilution technique, bucket and stopwatch, orifices, or combinations thereof. The most common method used was the lithium dilution technique in which a known standard solution of lithium chloride is added at a constant rate to the wastewater upstream of the sampling point. The lithium concentration measured in the collected samples allows the calculation of the wastewater flow rate. Average loadings over the compositing period were estimated as the product of the measured contaminant concentration and the average flow over the sampling period.

RESULTS

Discussions of each industry known to be within the Ley Creek Sanitary District (and extensions) are presented alphabetically in Appendix A. Included for each industry is a brief outline of manufacturing processes, a description of wastewater production and disposal, and recommendations of wastewater management procedures. Nineteen industries were considered to have wastewater characteristics which required sampling and analysis. Descriptions of these sampling and analysis surveys are included in the respective industrial discussions.

The estimated wastewater characteristics of all industries contacted are summarized in Table 1. Also included in Table 1 are the point of discharge (Ley Creek Treatment Plant, Ley Creek or other) and the potential for clean water segregation.

Within the Ley Creek Drainage Area approximately 9.1 mgd wastewater were accounted for in the survey. Approximately 3.3 mgd of wastewater are being discharged directly to Ley Creek or its tributaries. Of this total, approximately 2.7 mgd are comprised of the total process wastewaters of the Crouse Hinds Co., Will and Baumer Candle Company, General Motors - Ternstedt Division and Syracuse China Corporation. Approximately 5.8 mgd of industrial wastewaters are discharged to the Ley Creek Sewage Treatment Plant. Of the industrial wastewater discharged to the treatment plant 0.2 mgd are relatively uncontaminated (or could be made so) and could be diverted to storm sewers.

The results of the Ley Creek Sewage Treatment Plant influent sampling and analysis survey are contained in Appendix D. The raw, ranked raw, extended

and ranked extended data are listed in Tables LC-1 through LC-4, respectively. A summary of these results is presented in Table 2. The sampling survey described a wastewater highly variable in organic load but without significant toxicity problems. BOD_5 concentrations ranged from 117 mg/L to 1,620 mg/L over the 7-day survey with a median BOD_5 concentration of 399 mg/L. Metal concentrations were generally quite low. The maximum metal level, obtained by adding the maximum observed concentrations of chromium, copper, zinc, cadmium and nickel, totalled less than 4 mg/L.

A comparison of the wastewater characteristics observed at the Ley Creek Sewage Treatment Plant influent with the summation of estimated industrial and municipal discharges is presented in Table 3. Samples of the Ley Creek influent were taken to reflect the loading over a 24-hour day. However, the majority of industries sampled operate on a one or two shift basis. In those instances where samples were mainly representative of the working shifts only, the values obtained were adjusted so that they could be compared to the Ley Creek influent on a more equitable basis. This adjustment consisted of multiplying the mean values by the fraction of the day that the waste producing processes were in operation. For the municipal discharge, flow, BOD_5, suspended solids and oil and grease were estimated for the approximately 40,000 people within the Ley Creek Sanitary Districts. Agreement of estimated and observed loadings within normal sample variation were generally demonstrated with the exception of the oil and grease (Carbon Tetrachloride Extractables) values. Approximately 30 percent of the mean oil and grease content in the Ley Creek Sewage Treatment Plant influent could be accounted for in the estimated industrial and municipal discharges. It should be noted that samples were taken for oil and grease only in those industrial wastewaters where is was thought to be present (i.e., slaughter houses, rendering plants, processes using lubricating or cutting oils).

DISCUSSION

The information obtained from the industrial interviews and the sampling and analysis surveys indicate that the majority of organic loading discharged to the Ley Creek Sewage Treatment Plant is contributed by Bristol Laboratories. Although there does not appear to be a toxicity problem at the treatment plant, a number of industries were found to discharge unacceptable concentrations of metals and cyanides. Definite restrictions must be placed on these industries to prevent the batch dumping of metals and cyanides. These restrictions should be consistent with the "Rules and Regulations Governing the Use of Public Sewers" promulgated by the Onondaga County Division of Drainage and Sanitation. A copy is attached in Appendix C.

Table 2

Ley Creek Influent
Wastewater Characteristics

Parameter	mg/L			Pounds/Day		
	Mean	Median	Range	Mean	Median	Range
Flow (MGD)	13.7	14.0	8.7-18.8	13.7	14.0	8.7-18.8
BOD_5	465	399	177-1620	51,073	47,791	15,354-202,419
BOD_{UC}	642	560	212-2010	71,117	69,572	19,912-251,149
COD	1,038	944	329-2784	115,965	101,879	26,309-341,738
pH	-	7.0	6.0-8.8	-	7.0	6.0-8.8
Acidity[1]	8	0	0-60	838	0	0-6,647
Alkalinity[1]	12	0	0-154	1,320	0	0-23,091
SS	652	456	20-2492	74,776	54,205	1,599-325,906
VSS	319	260	72-1312	36,362	29,468	- -106,011
Oil and Grease	90.8	79.5	24.4-286.0	10,326	8,634	2,602-22,496
Cyanide	0.067	0.019	0.001-0.758	8.71	1.99	0.09-95.98
Phenol	0.25	0.17	0.01-0.98	29.40	19.49	0.80-113.95
Chromium	0.32	0.26	0.12-1.38	39.91	30.37	10.19-198.87
Copper	0.28	0.26	0.10-0.62	34.65	32.48	9.09-76.22
Zinc	0.72	0.74	0.17-1.41	84.79	93.75	18.11-183.22
Cadmium	0.06	0.05	0.02-0.31	8.45	5.93	1.5-40.54
Nickel	0.145	0.134	0.020-0.265	16.22	15.59	2.05-38.19
NH_3-N	16.3	15.4	7.8-30.8	1,873.3	1,775.2	864.1-3,540.5
Org-N	28.2	26.4	10.6-56.3	3,278.2	3,111.4	979.6-6,822.2
Ortho-PO_4	29	25	8-180	3,244	2,957	727-15,294
Total-PO_4	55	54	15-230	6,397	6,762	1,200-19,542

[1]To pH 7.0

Table 3

Comparison of Observed and Estimated
Ley Creek Sewage Plant
Influent Characteristics

Parameter	Observed Ley Creek Influent			Industrial Survey (Mean)	Municipal[2] Estimates (Mean)	Estimated Total Ley Creek Influent (Mean)
	Mean	Median	Range			
Flow (MGD)	13.7	14.0	8.7-18.8	5.8	4.0	9.8
BOD_5	51,073	47,791	15,354-202,419	32,870	8,000	40,870
Suspended Solids	74,776	54,205	1,599-325,906	51,400	8,000	60,000
Oil and Grease[1]	10,326	8,634	2,602-22,496	1,260	1,330	2,590
Cyanide	8.71	1.99	0.09-95.98	51.6	-	51.6
Chromium	39.91	30.37	10.19-198.87	28.1	-	28.1
Copper	34.65	32.48	9.09-76.22	45.9	-	45.9
Zinc	84.79	93.75	18.11-183.22	69.0	-	69.0
Cadmium	8.45	5.93	1.5-40.54	23.9	-	23.9
Nickel	16.22	15.59	2.05-38.19	26.0	-	26.0

[1] CCl_4 Extractables
[2] Assuming population of 40,000

A number of industries were found to discharge contaminated wastewaters to surface drainage within the Ley Creek area. Of the major industries now discharging, only General Motors - Ternstedt Division has extensive treatment facilities. Crouse Hinds is currently involved in a wastewater management program. Several control systems have been installed and more are planned, but unacceptable quantities of pollutants still are being discharged to Ley Creek. Syracuse China Corporation is also discharging unacceptable contaminant quantities to Ley Creek. Will and Baumer Candle Company and General Electric Company at Electronics Park are discharging significant volumes of relatively uncontaminated cooling water to Ley Creek and Bloody Brook, respectively. However, with certain recommended in-plant adjustments, it is thought that this method of disposal could continue for these two industries.

CONCLUSIONS

1. Bristol Laboratories discharges more than 50 percent of the organic load received at the Ley Creek Sewage Treatment Plant.

2. Contaminant levels of the Crouse Hinds Company and Syracuse China Corporation wastewaters currently being discharged to Ley Creek must be reduced significantly.

3. A number of industries discharge significant concentrations of metals and cyanides to the Ley Creek Sewerage System. Upon dilution in the entire wastewater flow, these discharges should not normally affect biological treatment. The potential for such interference with treatment processes exists.

RECOMMENDATIONS

1. Recommendations for wastewater management as outlined in each of the individual discussions (Appendix A) should be implemented.

2. Final disposition of industrial wastewaters should await the completion of biological treatability studies and the wastewater collection master plan currently being developed.

ABSTRACT

As part of an overall study of joint municipal-industrial wastewater treatment, Onondaga County, New York, retained ROY F. WESTON to contact 139 industries in the Ley Creek Drainage Area regarding wastewater management and discharges. A brief description of each industry is presented together with wastewater production and disposal and recommendations for wastewater management. Industrial processes surveyed included casting, candle-making, electronics, metal fabrication, machining, milk, plating, pharmaceutical, rendering, slaughtering, soft drinks, tool and dies, among others. Samples were collected at 19 industries. The major problem was found to be organic discharge from a pharmaceutical plant.

KEYWORDS

Ammonia, BOD, COD, Chromium, Copper, Cyanides, Industrial Wastes, Metals, Metal Finishing, Metal Plating, New York, Nickel, Nutrient, pH, Pharmaceuticals, Phosphorus, Slaughterhouses, Suspended Solids, Zinc.

APPENDIX A

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Acorn Tool Company
311 North Highland Avenue
East Syracuse, New York

MANUFACTURING PROCESSES

The Acorn Tool Company repairs air conditioner parts for the Carrier Corporation on a "job shop" basis. It has 2 employees and is located in the basement of a private home.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is limited to sanitary sources only. An estimated 20 gallons per day is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Advanced Welding Company
Court Street Road
Syracuse, New York

MANUFACTURING PROCESSES

The Advanced Welding Company is a welding "job shop" employing 2 to 3 men on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is limited to sanitary sources. Although water is used in cooling the welding machine, it is continuously recirculated. Total water usage averages 40 gallons per day. All wastewaters are discharged to a septic tank on the plant grounds.

SAMPLING AND ANALYSIS SURVEY

This wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem at this location. As the waste is entirely sanitary, it could be included in the Ley Creek Sewerage System without problems, if this becomes desirable.

RECOMMENDATIONS

Continue to dispose of sanitary wastewaters to the septic tank system as long as it is adequate and appropriate.

Air Pro Company
3570 Burnet Avenue
East Syracuse, New York

MANUFACTURING PROCESSES

The Air Pro Company is a job shop for the fabrication of metal and plastic prototype units. At present they employ 3 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Water is not used in the fabrication processes described above. All waste cutting oils are drummed and hauled to land disposal. An estimated 30 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Airco Plating Company, Inc.
1968 Teall Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Airco Plating Company plates chrome, nickel, copper, cadmium, zinc, and silver on a "job shop" basis. Conventional plating processes are utilized employing acids, alkalis, cyanide solutions, and metal salts. Airco Plating employs four persons and operates 8 hours per day, 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

The primary source of process wastewaters is the overflow from various rinse tanks. From observations made at the time of the initial visit, it appeared that more rinsewater than necessary was being used. All overflow is discharged to open floor drains and eventually flows into the sanitary sewer. Sanitary wastewaters combine with the rinse tank overflow in this sanitary sewer. The combined sanitary/process waters are discharged to the Ley Creek Sewerage System. Effluent flow is not measured. From data supplied by Airco Plating, the total wastewater use averages 39,000 gallons per working day. Based on this figure, the average flow rate during the 8-hour working period was estimated at 117,000 gallons per day. Sanitary water usage is minimal, an estimated 80 gallons per day.

SAMPLING AND ANALYSIS SURVEY

Composite samples of the plating process wastewater were collected on June 27, 28 and July 1, 1968, during the production shift. These samples were analyzed for COD, pH, acidity or alkalinity, suspended solids, total solids, cyanides, chromium, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate.

The results of the sampling and analysis survey are presented in Table AP-1. The rates of contaminant discharge expressed in pounds per day are given in Table AP-2. Significant concentrations of acidity, cyanides, chromium, copper, and cadmium are discharged to the sewer. In addition, pH values below

3.0 were found during two of the three composite sampling periods. Since these contaminant concentrations are average values over 6 to 7 hour periods, short-term acidity levels would be expected to be considerably higher.

The average flow rates during the sample compositing periods varied from 229,000 gallons per day to 350,000 gallons per day. Flow rates over the compositing periods were calculated from influent water meter readings taken at the start and completion of each compositing period. Flow rates are relatively constant throughout the production period.

DISCUSSION

The wastewater analyses indicate relatively high concentrations of cyanides and metals. The total poundage of acidity, cyanide, and metals discharged, although relatively low, is a significant fraction of the quantity reaching the Ley Creek Sewage Treatment Plant. Table 1 lists the total pounds of contaminants discharged by Airco Plating, as compared to the general level of contaminant loading in the Ley Creek Sewage Treatment Plant influent. Data from the Ley Creek influent sampling survey are representative of the entire 24-hour daily period. Therefore, to make a valid comparison, the levels listed for Airco Plating had to be adjusted to reflect the actual values per 8-hour operating day, or approximately one-third of those shown on Table AP-2. On a mean (average) basis, Airco Plating contributes approximately 4.5 percent of the chromium and 13 percent of the copper received at the Ley Creek Treatment Plant. The fraction contributed on short-term (slug) basis probably would be considerably higher.

An apparent anomaly exists in that the overall quantity of cyanide and cadmium discharged by Airco Plating appears to be greater than the amount received by the Ley Creek plant. A possible explanation is that sampling at the two locations was undertaken during different weeks. Simultaneous sampling periods are required to ascertain the absolute effect of the industrial discharge on the treatment plant. It should be noted, however, that no apparent cyanide or metals treatability problem exists at the Ley Creek plant.

Average flow values taken from the influent water meter are approximately three times the rates as estimated by Airco personnel from water use records. Because the reason for this discrepancy is not clear at present, all loading values were calculated using the flow observed during the sampling survey.

CONCLUSIONS

Airco Plating discharges a wastewater with significant concentrations of metals and cyanide and exhibits extremely low pH values for extended periods of time. The impact of this wastewater on the Ley Creek plant does not

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Airco Plating Co.		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	0.10	-	0.23-0.35
BOD_5	51,073	47,791	15,354-202,419	-	-	-
BOD_{uc}	71,117	69,572	19,912-251,149	-	-	-
COD	115,965	101,879	26,309-341,738	50	-	55-185
pH	-	7.0	6.0-8.8	-	-	2.4-6.5
Acidity	838	0	0-6,647	130	-	38-734
Alkalinity	1,320	0	0-23,091	0	-	0
SS	74,776	54,205	1,599-325,906	6		0-34
VSS	36,362	29,468	- -106,011	-	-	-
TS	-	-	-	-	-	-
Oil and Grease	10,326	8,634	2,602-22,496	-	-	-
Cyanide	8.71	1.99	0.09-95.98	11.5	-	30.9-39.6
Phenol	29.40	19.49	0.80-113.95	-	-	-
Chromium	39.91	30.37	10.19-198.87	2.5	-	1.46-15.3
Copper	34.65	32.48	9.09-76.22	4.6	-	7.43-17.1
Zinc	84.79	93.75	18.11-183.22	2.3	-	3.5-12.4
Cadmium	8.45	5.93	1.5-40.54	12.0	-	20.9-48.0
Nickel	16.22	15.59	2.05-38.19	0.7	-	1.9-2.3
NH_3	1,873.3	1,775.2	864.1-3,540.5	-	-	-
Org-N	3,278.2	3,111.4	979.6-6,822.2	-	-	-
Ortho-PO_4	3,244	2,957	727-15,294	2.3	-	6.1-7.6
Total-PO_4	6,397	6,762	1,200-19,542	7.4	-	9.5-39.3

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

appear to be detrimental at this time because of the relatively low total quantity of pollutants discharged. Operating practices, however, should be controlled to reduce pollutant discharge to a minimum. The low pH values observed are clearly unacceptable under Section 3 (f) of the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

1. Initiate a program to reduce losses of metals and cyanides through improved operating practices.
2. Investigate methods and procedures to reduce water use.
3. Provide facilities to prevent accidental discharges or batch dumps of metals, cyanides, acids, or alkalis.
4. Maintain wastewater pH between 5.5 and 9.0.

AIRCO PLATING CO., INC.
SYRACUSE, NEW YORK

TABLE AP-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

PLATING ROOM DISCHARGE

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
071	06 27 68	1445	6.3	0.293	68	2.4	0	300	0	620	16.2	0.60	6.85	2.1	16.0	0.77	2.5	7.5
079	06 28 68	1415	6.9	0.350	19	2.8	0	125	6	374	11.3	5.25	5.85	1.2	7.2	0.77	2.5	13.5
080	07 01 68	1415	7.0	0.229	97	6.5	0	20	18	525	16.2	2.80	3.90	6.5	25.2	1.18	4.0	5.0

TABLE AP-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

PLATING ROOM DISCHARGE

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
071	06 27 68	1445	0.293	166	2.4	0	734	0	1517	39.6	1.46	16.76	5.1	39.1	1.88	6.1	18.3
079	06 28 68	1415	0.350	55	2.8	0	364	17	1090	32.9	15.30	17.05	3.5	20.9	2.24	7.2	39.3
080	07 01 68	1415	0.229	185	6.5	0	38	34	1001	30.9	5.34	7.43	12.4	48.0	2.25	7.6	9.5

*=NO ANALYSIS

Algeo Manufacturing Company
Miller Electroplating & Anodizing Co.
1620 Burnet Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Algeo Manufacturing Company and the Miller Electroplating & Anodizing Company are located in the same building and are under the same management. The former is a "job shop" machining operation while the latter, contrary to its name, is mainly an anodizing operation. According to plant personnel, no electroplating is performed. A total of 14 people are employed jointly on the first shift and three on the second.

Note: Subsequent investigations indicated that these industries are within the Metropolitan Sanitary District. The wastewater, therefore, was not sampled.

WASTEWATER PRODUCTION AND TREATMENT

Total water use at both companies, based upon previous water bills, is approximately 1,400 gallons per day.

No wastewater was apparent in the Algeo section of the building. Coolants used are on a closed system and should never be dumped to the sewer.

Process wastewaters result from a number of sources in the anodizing section. A general description of the chemicals used in the operation include alkaline cleaners, various acid solutions, and colored dyes.

All rinsewaters are discharged through floor drains into a sump and then to the sanitary sewer. This flow should average less than 1,200 gallons per day. According to management, the pH of the wastewater has been checked and found to be relatively neutral.

An estimated 170 gallons per day of sanitary wastewater are discharged with the process wastewater to the Metropolitan Sewerage System.

SAMPLING AND ANALYSIS PROGRAM

No wastewater samples were collected since this wastewater discharges to the Metropolitan Treatment Plant.

CONCLUSIONS

No industrial wastewater problem currently exists at Algeo Manufacturing Company. Miller Electroplating & Anodizing Company discharges a low volume of process wastewater. The wastewaters from this type of operation are generally acidic in nature.

RECOMMENDATIONS

Maintain discharge consistent with Onondaga County's "Rules and Regulations Governing the Use of Public Sewers."

Allied Tool Corporation
Oliva Drive
Syracuse, New York 13211

MANUFACTURING PROCESSES

The Allied Tool Corporation is a tool and die shop with 19 employees. Operation is on a one-shift per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

An estimated 190 gallons/day of sanitary wastewaters are discharged to a septic tank on the plant grounds. Wastewater is generally limited to sanitary sources. A possible additional source of pollution could arise from the grinder lubrication systems. Although the oil emulsions used in these systems are completely recirculated, they become unusable after 6-12 months.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There appears to be no significant waste disposal problem.

RECOMMENDATIONS

1. Wastewaters should continue to be discharged to the septic tank as long as this system is adequate and appropriate.
2. Oil-water lubricating emulsions should be disposed of under controlled conditions.

Barnes and Cone Inc.
Court Street Road
Syracuse, New York

MANUFACTURING PROCESSES

Barnes and Cone Inc. produces various sizes and shapes of masonry building blocks. Currently 22 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Of the estimated 10,000 gallons per day of water used, 220 gallons are discharged to an on-site septic tank. The balance is used in the production of building blocks.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the septic tank as long as this system is adequate and appropriate.

Ray F. Beehner and Co.
201 Wavel Street
Syracuse, New York

MANUFACTURING PROCESSES

Ray F. Beehner and Co. manufactures wooden church furniture. At present, 8 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is limited to sanitary sources and is estimated at 80 gallons per day. It is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.

Bliss Steel Products Corporation
617 Manlius Street
East Syracuse, New York

MANUFACTURING PROCESSES

The Bliss Steel Products Corporation fabricates both aluminum and steel window sash for industrial usage. In the manufacturing process, the sash is fabricated from aluminum and steel sections. Metal oxides present on the fabricated item are removed by successive immersions in phosphoric acid, sodium hydroxide, detergents, zinc phosphate, and chromic acid. After cleaning, the metal products are coated with an organic sealant for corrosion protection. Bliss Steel employs 25 persons and operates 8 hours per day, 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

The principal sources of process wastewater are the rinse tanks located after each of the cleaning operations described above. The continuous overflow from these rinse tanks and, periodically, the spent immersion bath liquids are discharged via a common manhole to the Ley Creek Sewerage System.

The segregated sanitary wastewaters are also discharged to the Ley Creek Sewerage System.

The total average water usage has been estimated by Bliss Steel personnel at 145,000 cubic feet per year or approximately 4,400 gallons per working day. Assuming an average sanitary water use of 10 gallons per capita per day, the average process water use over the 5-day working week would be 4,150 gallons per day. The process flow rate during the 8-hour production period would average 12,500 gallons per day.

SAMPLING AND ANALYSIS SURVEY

Composite samples of the combined rinse tank wastewaters were collected on July 16, 17, and 18, 1968, during the working shift. Samples were analyzed for COD, pH, alkalinity or acidity, suspended solids, total solids,

chromium, copper, zinc, nickel, orthophosphate, and total phosphate. The results of the sampling and analyses survey are presented in Table BS-1, and the rates of contaminant discharge, expressed in pounds per day, in Table BS-2. During the first two days of the survey, operations were "normal", but on the third day, three rinse tanks (chromic and phosphoric acids and sodium hydroxide) were dumped.

The average flow during the sample compositing period was estimated by the lithium dilution technique, which requires the addition of a lithium chloride solution at a known rate and concentration, upstream of the sampling point. Based on the lithium measured in the sample, the flow rate was calculated.

DISCUSSION

The average concentration and quantity of pollutants discharged from Bliss Steel are of a relatively low magnitude. Flow rates determined during the sampling survey were roughly one-third the average level estimated by Bliss Steel personnel. The reason for this difference is not known at present. However, even if the flow was increased by a factor of three, average contaminant loads still would not be particularly significant in relation to the Ley Creek Sewage Treatment Plant influent loads.

CONCLUSIONS

Based upon the results of discussions with Bliss Steel personnel and the sampling and analyses survey, it is concluded that the average contaminant discharges would not have any measurable impact upon the Ley Creek Sewage Treatment Plant.

Batch dumps of acid or alkali cleaning solution would result in occasional pH value fluctuations outside the approved range of 5.5 to 9.0, as specified in Section 3 (f) of the "Onondaga County Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Based on the above conclusions, the following recommendations are made:

1. Neutralize all spent acid and alkali rinse and cleaning solutions to pH values between 5.5 and 9.0 before dumping.
2. Investigate feasibility of discharging acid tanks and alkaline tanks simultaneously to minimize neutralization requirements.
3. Provide capability to discharge neutralized spent solutions at a controlled rate.

BLISS STEEL PRODUCTS CORPORATION
EAST SYRACUSE, NEW YORK

TABLE BS-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

CLEANING BATH WASTEWATER

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	VSS	TS	T.CHR	COPPER	ZINC	NICKEL	O-PO4	T-PO4	T.FE
146	07 16 68	1525	8.3	0.004	29	7.6	33	0	72	0*	535	0.05	0.08	1.24	0.0	18.0	22.4	25.6
159	07 17 68	1525	8.3	0.004	10	7.8	80	0	86	0*	0*	2.60	0.05	0.15	0.6	22.5	26.8	0.0*
167	07 18 68	1600	8.3	0.002	125	8.3	75	0	204	70	1077	0.15	0.14	0.39	0.0	24.0	34.0	0.0*

TABLE BS-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

CLEANING BATH WASTEWATER

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	VSS	TS	T.CHR	COPPER	ZINC	NICKEL	O-PO4	T-PO4	T.FE
146	07 16 68	1525	0.004	1	7.6	1	0	3	0*	19	0.00	0.00	0.04	0.0	0.6	0.7	0.9
159	07 17 68	1525	0.004	0	7.8	3	0	3	0*	0*	0.09	0.00	0.00	0.0	0.7	0.9	0.0*
167	07 18 68	1600	0.002	2	8.3	1	0	4	1	21	0.00	0.00	0.00	0.0	0.4	0.6	0.0*

*=NO ANALYSIS

Bomac, Inc.
407 Brown Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Bomac, Inc. assembles and tests electronic control panels on a "job shop" basis. Fourteen persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is limited to sanitary sources and is estimated at 140 gallons/day. The wastewater is discharged to a septic tank-drainage field system on the plant grounds.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the septic tank as long as this system is adequate and appropriate.

The Borden Company
East Molloy and Thompson Roads
East Syracuse, New York

MANUFACTURING PROCESSES

The Borden Company makes ice cream at its plant in East Syracuse. Currently, 57 persons are employed on the first shift and 10 on the second, or clean-up shift. Production is on a 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Of the total 77,000 gallons of water used each working day, 3,500 gallons are incorporated into the ice cream. The majority of the water is used in clean-up operations on the second shift. All process wastewater goes to two sumps in series where grease and solids are removed prior to discharging the wastewater to the Ley Creek Sewerage System. The sumps are cleaned out semi-annually. The second sump was installed because of grease problems at a nearby sewage pumping station. Since the sump has been in operation, Borden personnel reports that no further complaints have been received.

A large volume of water is used in washing out the 5,000 gallon tank trucks in which raw materials (cream, condensed milk) are delivered. The first rinsewater is pumped to the storage tanks, but subsequent rinsewaters are discharged to the process sewer. Liquid sugar tankers are not cleaned at the plant.

Plant management appear to be aware of water saving procedures. Some of the cleaning hoses have water savers although these meet with some employee resistance. In general, running hoses are not permitted. All cooling water is recirculated. The potential for increased water savings would require detailed study.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

Organic contamination discharged from this location should be compatible with biological treatment. The concentration of contaminants may occasionally exceed the allowable discharge limits set forth in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Continue to discharge the wastewaters as described above to the Ley Creek Sewerage System.

Bristol Laboratories
Syracuse, New York

MANUFACTURING PROCESSES

Bristol Laboratories is one of the largest producers of antibiotics in the United States. The basic manufacturing process is aerobic fermentation with subsequent solvent extraction of the antibiotics. The solvents then are reclaimed by steam stripping. Although antibiotics are the principal product, Bristol also produces antihistamines and small quantities of certain bulk organic chemicals.

Currently, 1,788 persons are employed on the first shift, 96 on the second shift, and 76 on the third shift. Although the plant has a nominal 5-day week schedule, manufacturing processes continue on a 7-day week, 24-hour basis.

WASTEWATER PRODUCTION AND TREATMENT

The contaminants present in the wastewater are primarily organic in nature, but some acids and alkalis are discharged. Among the raw materials used in production processes are organic materials (cereal meals, molasses, starch, and yeast), solvents (acetone, butanol, methanol, methyl isobutyl ketone (MIBK), and toluene), acids (nitric, sulfuric, hydrochloric, and oxalic), and alkalis (potassium hydroxide and caustic soda).

The average total water usage at this plant was estimated by Bristol Laboratories at approximately 1.5 mgd. Process water was estimated at approximately 800,000 gallons per day and cooling water discharges at approximately 360,000 gallons per day. The balance is used in the cafeteria, shower, and other sanitary facilities.

Wastewaters generated at Bristol's facility are discharged to process sewers. The process sewer flow includes both sanitary and industrial wastewaters as well as all spent fermentation liquors, solvents, still bottoms, filter aids, and spoiled reactant batches. Since these wastewaters are discharged to the Ley Creek Sewage Treatment Plant, wastewater characteristics and loadings must meet acceptance standards established on 28 February 1968, by the Commissioner of Public Works. The allowable discharge limits to the public sewer

are included in the code, "Rules and Regulations Governing the Use of Public Sewers." A copy can be found in Appendix C.

Stormwater is discharged to either Hedsons Brook or the South Branch of Ley Creek, both of which eventually flow into Ley Creek.

SAMPLING AND ANALYSIS SURVEY

GENERAL

Based upon information gained during the initial tour of the plant facilities, a number of process sewers and the major storm outfall were selected as sampling points. The process and storm sewer systems are shown in Bristol Laboratories' Plot Plan entitled "General Sewer System" (Drawing No. X-Y-228-7). A copy of the map is not appended. The sampling and lithium addition points used in the survey are described in Table 1. Manhole elevations shown on the Plot Plan were used for identification of the specific manholes.

Flow determinations in the designated sewers were made by the lithium dilution technique, bucket and stopwatch technique, or visual estimate. The lithium dilution technique requires the addition of a lithium chloride solution, at a known rate and concentration, upstream of the sampling point. From the lithium concentration found in the downstream sample, the flow rate can be calculated.

An extensive grab sampling program was undertaken for the process/sanitary sewer at Manholes 1 and 3, since it was felt that the majority of the wastewater contaminants were discharged through these sewers. The grab survey consisted of obtaining one sample during each consecutive 4-hour period over seven consecutive days. The time of sampling was randomly selected within each 4-hour period. For flow estimates, lithium chloride solutions were fed at upstream locations for approximately 10 to 15 minutes prior to grab sampling. Flow measurements for the composite samples collected at Manholes 4, 5, and 7 were also estimated using the lithium dilution technique; the lithium chloride solution being fed continuously over the entire compositing period. Flow rates for the composite samples collected at Manhole 9 were estimated at the time of sampling by "bucket and stopwatch," whereas the flow at Manhole 2 was estimated visually.

RESULTS

A summary of pertinent statistical parameters (mean, median, range) developed from the data collected at each of the sampling points is presented in Table 2. The raw and extended data upon which the statistical analyses were performed are contained in Tables BL-1 through BL-14.

Table 1

Bristol Laboratories

Sampling Point Locations

Manhole No.	Description	Type of Samples	Analyses
1	Process/sanitary sewer at northwest corner of Building 2-B (boiler house). Invert elevation - 498 feet.	Random grab samples	BOD_5, BOD_{ult}, COD, pH, alk/acid, SS, VSS, NH_3-N, TON[1], $O\text{-}PO_4$, $T\text{-}PO_4$
L-1	Sump in southwest corner of Building 2-B; lithium addition point for MH 1.	None	None
2	Process/sanitary sewer at end of 6-inch vitrified tile sewer, flowing east from Building 2-B.	Composite	Same as MH 1 above
3	Process/sanitary sewer north of the northeast corner of Building 32. Invert elevation - 37.3 feet.	Random grab samples	Same as MH 1 above
L-3	Between Buildings 14 and 30. Invert elevation - 44.1 feet. Lithium addition point for MH 3.	None	None
4	Process/sanitary sewer approximately 10 feet from southeast corner of Building 32. Invert elevation - 40.17 feet.	Composite and grab	Same as MH 1 above
L-4	Located at southwest corner of Building 32. Invert elevation - 41.6 feet. Lithium addition point for MH 4.	None	None
5	Process/sanitary sewer at southwest corner of Building 20, directly under cyclone fence. Manhole elevation - 51.34 feet.	Composite and grab	Same as MH 1 above
L-5	Located at northwest corner of Building 20. Lithium addition point for MH 5.	None	None
7	Process/sanitary and cooling water sewer north of cooling tower, next to Building 15-B. Invert elevation - 53.2 feet.	Composite	Same as MH 1 above
L-7	Cooling tower discharge; lithium addition point for MH 7.	None	None
9	Storm sewer northeast of Building 30, approximately 21 feet upstream of discharge into Hedsons Brook.	Composite and grab	Same as MH 1 above

[1]Total Organic Nitrogen

The wastewater sampled at Manhole 1 contains sanitary flow and wastewaters from the following unit operations: air compression, steam generation (boiler house), capsule inspection, tableting, sterile filling, packaging, mechanical maintenance, and quality control. Contaminant levels were highly variable in all parameters measured. However, analysis of the frequency distribution indicates a definite skew towards relatively few occurrences of high contaminant concentrations. Mean values are as high as twenty times the median values. Although median values are relatively low, extremely large quantities of organic matter, acid and alkali, can be found in this wastewater. Variations of particular interest are the pH from 2.4 to greater than 11.0, COD from 0 to 13,500 lbs/day, and suspended solids from 6 to 48,000 lbs/day.

The wastewater sampled at Manhole 2 emanates primarily from the boiler house building. The flow was visually estimated to be less than ten gallons per minute. Although on several occasions an oily iridescence was observed, no significant degree of pollution was present at this sampling point.

The wastewater sampled at Manhole 3 is the combined flow from the fermentation development and chemical extraction areas, as well as from other smaller sources. The majority of all organic pollution from Bristol Laboratories is discharged through this sewer. The sample analyses showed the wastewater to be highly variable in quality and quantity, but without the high degree of frequency distribution skew evidenced at Manhole 1. This wastewater contains large amounts of organic material. Median values of 59,000 lbs/day COD and 35,000 lbs/day suspended solids with maximum observed values of 139,000 lbs/day and 375,000 lbs/day, respectively, indicate the magnitude of the problem. The pH problem is also severe, observed values varying from less than 2.0 to greater than 12.0. The mean flow is 1.2 mgd.

The wastewater sampled at Manhole 4 is discharged from the toxicology department (Building 32) and is predominantly animal cage washwater. Considering only composite samples taken over periods varying from 2 to 6 hours, relatively low amounts of organic material are produced (100 lbs/day COD) in approximately 20,000 gallons per day. Grab samples, taken when the cage washer was in operation, indicate a large increase in the quantity of the wastewater discharge (up to 288,000 gallons per day), with organic discharges reaching 5,700 lbs/day COD. Apparently some acid is discharged, as pH values of 3.3 and 3.4 were measured during two separate compositing periods.

The sewer at Manhole 5 receives wastewater from the microbiology research, biochemistry extraction, and product development departments and from the cafeteria. Composite samples were collected over various time intervals,

but grab samples were collected when strong solvent odors, presumably MIBK, were perceived. Organic discharge at this sampling point is significant and highly variable. Grab samples, taken when the solvent odor was strongest, showed organic loads as high as 5,100 lbs/day COD. Composite samples indicated average COD loads as high as 2,200 lbs/day for periods up to 13.7 hours. The pH was generally on the alkaline side with values ranging from 6.2 to 9.7. The flow rate was fairly constant, normally ranging between 100,000 to 200,000 gallons per day.

According to the Bristol Laboratories General Sewer System diagram, the majority of the discharge through Manhole 7 is cooling tower overflow with the possible addition of sanitary wastewaters from the carpenter shop. Flow rates were relatively constant; the maximum range observed was 229,000 to 338,000 gallons per day. Organic pollution, measured as COD, indicates significant amounts of contamination other than that produced by cooling water or sanitary sewage. COD values were measured as high as 1,272 mg/L, while the suspended solids level, in that particular sample (and in all other samples), was quite low, indicating the pollution was the result of soluble organics.

In previous wastewater samples analyzed by Bristol Laboratories, the main storm sewer was observed to contain organic contamination. The ROY F. WESTON survey corroborated this prior observation. Contamination in the storm sewer was traced by Bristol Laboratories to a cross-connection with a process/sanitary sewer. At the time of the survey, old sewer lines were being replaced to eliminate this cross-connection which should completely eliminate industrial contamination of the stormwater. Despite the cross-connection, the pollution found at Manhole 9 was generally of a rather low order (100-200 mg/L COD), although one 24-hour composite sample showed an average COD concentration of 1,084 mg/L.

DISCUSSION

The daily water use at the time of the sampling survey had increased from the average requirement of 1.5 mgd. This increase was attributed by Bristol Laboratories to a greater cooling tower demand and an increase in production.

The combined wastewaters from Bristol Laboratories can be characterized as highly organic and highly variable. As seen in Table 3, the plant effluent loadings account for more than half of the total BOD_5, COD, and suspended solids influent loadings to the Ley Creek Sewage Treatment Plant. Contaminant levels currently exceed the allowable limits.

Table 3

Bristol Laboratories

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Bristol Laboratories		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate[3]
Flow (MGD)	13.7	14.0	8.7-18.8	1.89	1.74	0.89-5.79
BOD_5	51,073	47,791	15,354-202,419	29,085	23,655	6,608-103,500
BODuc	71,117	69,572	19,912-251,149	47,126	46,570	10,489-127,800
COD	115,965	101,879	26,309-341,738	59,930	60,552	14,000-166,200
pH	-	7.0	6.0-8.8	-	6.5 (est)	<2.0- >12.0
Acidity	838	0	0-6,647	1,164	783	3-12,235
Alkalinity	1,320	0	0-23,091	3,045	8	0-101,600
SS	74,776	54,205	1,599-325,906	47,486	34,976	1,387-424,000
VSS	36,362	29,468	-106,011	14,231	13,917	450-62,250
TS	-	-	-	-	-	-
Oil and Grease	10,326	8,634	2,602-22,496	-	-	-
Cyanide	8.71	1.99	0.09-95.98	-	-	-
Phenol	29.40	19.49	0.80-113.95	-	-	-
Chromium	39.91	30.37	10.19-198.87	-	-	-
Copper	34.65	32.48	9.09-76.22	-	-	-
Zinc	84.79	93.75	18.11-183.22	-	-	-
Cadmium	8.45	5.93	1.5-40.54	-	-	-
Nickel	16.22	15.59	2.05-38.19	-	-	-
NH_3	1,373.3	1,775.2	864.1-3,540.5	319.2	210.8	1.2-1,465
Org-N	3,278.2	3,111.4	979.6-6,822.2	1,123.3	735.1	5.9-128.1
Ortho-PO_4	3,244	2,957	727-15,294	596.4	417.5	60.2-3,700
Total-PO_4	6,397	6,762	1,200-19,542	920.0	584.0	107-4,280

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.
[3]Maximum values calculated by adding maximum results from each sampling point. Minimum values obtained similarly by adding minimum values.

Because the sampling survey showed that both "clean" and highly contaminated wastewaters were being discharged to the same sewer, the potential exists for implementation of in-plant modifications and closer wastewater management, whereby clean waters can be diverted and discharged separately.

CONCLUSIONS

1. Contaminants in Bristol Laboratories' wastewaters contribute over 50 percent of the organic waste load received by the Ley Creek Sewage Treatment Plant.
2. The extreme variability in contamination levels is probably the principal cause of shock organic loads observed at the Ley Creek Sewage Treatment Plant.
3. Wastewater flowing through the process sewer at Manhole 3 contains the majority of contaminants discharged by Bristol.
4. Low contaminant levels found in some wastewater samples collected at Manholes 1, 2, and 7 during periods of high flows indicate the possible discharge of clean waters to process sewers.
5. A low order of organic contamination was generally observed in the main storm sewer.
6. Acidic pH values (observed at Manholes 1 and 3) could possibly result in sewer corrosion.
7. Bristol Laboratories' wastewater loadings exceed allowable limits established by the Onondaga County Department of Public Works in the 28 February 1968 ruling entitled, "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

1. Conduct a detailed in-plant water use and wastewater survey to determine the source, flow, and characteristics of all major wastewaters discharged to the Ley Creek Sewerage System.
2. Initiate a wastewater management program to reduce the incidence of shock organic and acid discharges and to reduce and/or segregate clean wastewaters. This should be done by in-plant activities wherever possible.

TABLE BL-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH 1

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	TS	NH3-N	TON	O-PO4	T-PO4
189	07 23 68	1017	0.276	35	84	170	7.0	0	0	278	166	0*	2.2	11.2	4.4	6.2
191	07 23 68	1420	0.111	396	624	802	6.4	0	10	148	62	0*	5.6	14.0	9.2	10.8
194	07 23 68	1750	0.075	78	126	141	7.1	2	0	46	32	0*	5.1	5.1	2.0	2.2
200	07 23 68	2225	0.092	387	906	1364	6.2	0	20	200	92	0*	26.6	15.4	1.3	2.5
201	07 24 68	0220	0.141	21	36	94	6.8	0	4	286	76	0*	0.1	0.0*	5.5	9.0
206	07 24 68	0720	0.190	27	36	56	7.0	0	0	54	36	0*	0.1	21.0	2.5	4.5
211	07 24 68	0900	0.584	39	150	850	2.4	0	186	516	44	0*	0.8	20.2	5.0	12.0
229	07 24 68	1427	0.049	72	189	785	6.8	0	4	174	58	0*	2.8	0.1	7.8	14.3
233	07 24 68	2010	0.050	270	297	383	6.8	0	4	44	24	0*	2.2	0.1	1.0	2.2
234	07 24 68	2325	0.036	432	576	1832	6.8	0	4	1028	812	0*	8.7	4.2	1.6	2.8
235	07 25 68	0410	0.033	3	15	159	7.0	0	0	582	174	0*	1.1	9.5	2.0	4.0
236	07 25 68	0535	0.000*	12	21	65	6.8	0	4	54	26	0*	0.1	1.1	1.1	2.6
262	07 25 68	1130	0.055	186	228	327	6.3	0	16	106	42	0*	0.1	7.0	9.5	14.0
266	07 25 68	1510	0.038	180	231	260	8.0	90	0	204	84	0*	1.6	17.4	53.5	190.0
276	07 25 68	1925	0.102	114	123	0*	9.3	132	0	72	22	0*	0.0	0.1	17.9	40.6
281	07 26 68	0020	0.020	13	15	19	6.4	0	6	86	58	0*	0.7	2.1	1.7	1.8
283	07 26 68	0150	0.019	30	36	84	6.1	0	8	64	50	0*	1.0	1.7	2.9	22.6
288	07 26 68	0725	0.033	96	120	327	6.6	0	8	198	146	0*	8.8	3.9	3.6	5.0
300	07 26 68	1230	0.052	21	27	56	7.0	0	0	70	70	0*	1.4	8.4	1.2	1.7
315	07 26 68	1645	0.032	93	114	0*	6.8	0	4	72	52	0*	5.6	25.2	6.8	8.3
319	07 26 68	1855	0.064	18	122	157	7.1	2	0	58	46	0*	1.4	5.6	2.4	4.5
322	07 26 68	2245	0.230	27	36	65	9.9	200	0	88	54	0*	1.4	4.2	9.6	16.0
326	07 27 68	0225	0.000*	15	18	28	>11.0	230	0	66	36	0*	0.8	3.4	21.8	23.0
329	07 27 68	0755	0.051	39	63	120	7.0	0	0	74	30	0*	2.2	5.6	2.6	2.8
332	07 27 68	1040	0.046	84	252	250	6.5	0	10	64	16	0*	1.4	4.8	10.0	11.8
334	07 27 68	1315	0.030	0*	0*	56	6.8	0	4	36	2	452	1.7	9.2	1.5	3.5
338	07 27 68	1850	0.073	30	37	0*	6.0	0	20	306	40	0*	1.1	3.4	0.3	3.6
341	07 27 68	2315	0.064	0*	0*	46	6.7	0	6	188	44	0*	0.0*	0.0*	0.0*	0.0*
343	07 28 68	0100	0.231	0*	0*	37	5.6	0	20	42	0	0*	0.0*	0.0*	0.0*	0.0*
345	07 28 68	0840	0.262	0*	0*	103	8.4	56	0	24	0	289	0.8	2.2	3.5	4.0
349	07 28 68	1210	0.028	0*	0*	56	6.8	0	4	64	16	476	0.6	2.2	0.4	0.8
354	07 28 68	1450	2.397	225	300	673	8.4	56	0	2408	248	0*	0.1	0.2	14.0	22.5
356	07 28 68	1925	0.445	420	630	878	6.7	0	6	20	2	0*	0.1	0.2	22.0	28.0
360	07 28 68	2220	0.028	0*	0*	19	6.6	0	8	92	24	0*	0.0*	0.0*	0.0*	0.0*
361	07 29 68	0310	0.030	0*	0*	39	6.5	0	10	114	30	0*	0.0*	0.0*	0.0*	0.0*
365	07 29 68	0610	0.027	0*	0*	0	7.0	0	0	34	12	0*	0.0*	0.0*	0.0*	0.0*
366	07 29 68	0905	0.043	0*	0*	187	6.4	0	12	202	104	0*	0.0*	0.0*	0.0*	0.0*
373	07 29 68	1350	0.064	0*	0*	343	6.6	0	8	134	98	0*	4.8	68.0	25.0	42.0
376	07 29 68	1805	0.305	0*	0*	9	6.6	0	8	4	0	0*	0.0*	0.0*	0.0*	0.0*
380	07 29 68	2120	0.033	10	10	18	6.9	2	0	22	0	0*	0.0*	0.0*	0.0*	0.0*
384	07 30 68	0355	0.100	3	9	37	10.5	190	0	60	0	0*	1.4	1.4	23.0	27.0
385	07 30 68	0625	0.195	3	12	55	10.5	140	0	74	12	0*	1.4	2.8	20.0	45.0

*=NO ANALYSIS

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 1

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	TS	NH3-N	TON	O-PO4	T-PO4
189	07 23 68	1017	0.276	81	193	392	7.0	0	0	640	382	0*	5.1	25.8	10.1	14.2
191	07 23 68	1420	0.111	367	578	743	6.4	0	9	137	57	0*	5.1	12.9	8.5	10.0
194	07 23 68	1750	0.075	49	79	89	7.1	1	0	29	20	0*	3.2	3.2	1.2	1.3
200	07 23 68	2225	0.092	298	699	1052	6.2	0	15	154	71	0*	20.5	11.8	1.0	1.9
201	07 24 68	0220	0.141	25	42	110	6.8	0	5	336	89	0*	0.1	0.0*	6.4	10.5
206	07 24 68	0720	0.190	43	57	89	7.0	0	0	86	57	0*	0.1	33.2	3.9	7.1
211	07 24 68	0900	0.584	190	731	4140	2.4	0	906	2513	214	0*	4.1	98.3	24.3	58.4
229	07 24 68	1427	0.049	30	78	326	6.8	0	2	72	24	0*	1.1	0.0	3.2	5.9
233	07 24 68	2010	0.050	113	124	160	6.8	0	2	18	10	0*	0.9	0.0	0.4	0.9
234	07 24 68	2325	0.036	131	174	554	6.8	0	1	311	245	0*	2.6	1.2	0.4	0.8
235	07 25 68	0410	0.033	1	4	44	7.0	0	0	161	48	0*	0.3	2.6	0.5	1.1
236	07 25 68	0535	0.000*	0*	0*	0*	6.8	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
262	07 25 68	1130	0.055	85	104	150	6.3	0	7	49	19	0*	0.0	3.2	4.3	6.4
266	07 25 68	1510	0.038	57	73	82	8.0	29	0	65	27	0*	0.5	5.5	16.9	60.1
276	07 25 68	1925	0.102	97	105	0*	9.3	113	0	62	19	0*	0.0	0.0	15.3	34.7
281	07 26 68	0020	0.020	2	3	3	6.4	0	1	15	10	0*	0.1	0.3	0.3	0.3
283	07 26 68	0150	0.019	5	6	14	6.1	0	1	11	8	0*	0.1	0.2	0.4	3.7
288	07 26 68	0725	0.033	27	34	92	6.6	0	2	56	41	0*	2.4	1.1	1.0	1.4
300	07 26 68	1230	0.052	9	12	24	7.0	0	0	30	30	0*	0.6	3.6	0.5	0.7
315	07 26 68	1645	0.032	25	31	0*	6.8	0	1	20	14	0*	1.5	6.8	1.8	2.2
319	07 26 68	1855	0.064	10	65	84	7.1	1	0	31	25	0*	0.7	2.*	1.2	2.4
322	07 26 68	2245	0.230	52	69	125	9.9	384	0	169	104	0*	2.6	8.0	18.4	30.7
326	07 27 68	0225	0.000*	0*	0*	0*	11.0	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
329	07 27 68	0755	0.051	17	27	52	7.0	0	0	32	13	0*	0.9	2.4	1.1	1.2
332	07 27 68	1040	0.046	33	98	97	6.5	0	4	25	6	0*	0.5	1.8	3.8	4.5
334	07 27 68	1315	0.030	0*	0*	14	6.8	0	1	9	1	115	0.4	2.3	0.3	0.9
338	07 27 68	1850	0.073	18	23	0*	6.0	0	12	188	25	0*	0.6	2.0	0.1	2.2
341	07 27 68	2315	0.064	0*	0*	25	6.7	0	3	100	23	0*	0.0*	0.0*	0.0*	0.0*
343	07 28 68	0100	0.231	0*	0*	71	5.6	0	39	81	0	0*	0.0*	0.0*	0.0*	0.0*
345	07 28 68	0840	0.262	0*	0*	225	8.4	122	0	52	0	631	1.7	4.8	7.6	8.7
349	07 28 68	1210	0.028	0*	0*	13	6.8	0	1	15	4	112	0.1	0.5	0.1	0.2
354	07 28 68	1450	2.397	4494	5992	13441	8.4	1118	0	48093	4953	0*	2.0	4.0	279.6	449.3
[illegible]	07 28 68	1925	0.445	1557	2335	3254	6.7	0	22	74	7	0*	0.3	0.7	81.5	103.7
360	07 28 68	2220	0.028	0*	0*	4	6.6	0	2	22	6	0*	0.0*	0.0*	0.0*	0.0*
361	07 29 68	0310	0.030	0*	0*	10	6.5	0	3	29	8	0*	0.0*	0.0*	0.0*	0.0*
365	07 29 68	0610	0.027	0*	0*	0	7.0	0	0	8	3	0*	0.0*	0.0*	0.0*	0.0*
366	07 29 68	0905	0.043	0*	0*	67	6.4	0	4	73	37	0*	0.0*	0.0*	0.0*	0.0*
373	07 29 68	1350	0.064	0*	0*	183	6.6	0	4	72	52	0*	2.5	36.3	13.3	22.4
376	07 29 68	1805	0.305	0*	0*	23	6.6	0	20	10	0	0*	0.0*	0.0*	0.0*	0.0*
380	07 29 68	2120	0.033	3	3	5	6.9	1	0	6	0	0*	0.0*	0.0*	0.0*	0.0*
384	07 30 68	0355	0.100	3	8	31	10.5	160	0	50	0	0*	1.1	1.1	19.3	22.6
385	07 30 68	0625	0.195	5	20	90	10.5	228	0	121	20	0*	2.2	4.3	32.6	73.4

*=NO ANALYSIS

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH 2

ID	DATE	TIME	SAMPLING PERIOD, HRS.	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
197	07 26 68	1755	6.6	0.014[1]	0*	0*	<5	7.1	1	0	6	0*	0.0*	0.0*	0.0*	0.0*
202	07 24 68	0250	8.9	0.014[1]	0*	0*	9	6.9	0	1	6	0*	0.0*	0.0*	0.0*	0.0*
208	07 24 68	0735	4.7	0.014[1]	0*	0*	9	6.9	0	1	34	4	0.0*	0.0*	0.0*	0.0*
231	07 24 68	1540	8.1	0.014[1]	15	22	28	7.0	0	0	34	14	3.4	0.1	0.1	1.2
242	07 24 68	2225	7.7	0.014[1]	0*	0*	19	7.0	0	0	20	14	0.1	1.4	0.1	1.6
245	07 25 68	0435	6.8	0.014[1]	0*	0*	9	7.2	2	0	20	14	0.1	0.8	0.2	0.8
264	07 25 68	1135	7.0	0.014[1]	0*	0*	19	6.3	0	7	30	14	0.1	1.1	0.1	0.1
279	07 25 68	1940	8.1	0.014[1]	0*	0*	<5	6.9	0	1	26	12	0.1	0.1	0.1	0.4
286	07 26 68	0055	5.2	0.014[1]	0*	0*	<5	6.0	0	8	4	4	0.0*	0.0*	0.0*	0.0*
302	07 26 68	1400	13.1	0.014[1]	0*	0*	<5	7.2	2	0	14	0*	0.0*	0.0*	0.0*	0.0*

TABLE BL-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 2

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
197	07 26 68	1755	0.014[1]	0*	0*	<1	7.1	0	0	1	0*	0.0*	0.0*	0.0*	0.0*
202	07 24 68	0250	0.014[1]	0*	0*	1	6.9	0	0	1	0*	0.0*	0.0*	0.0*	0.0*
208	07 24 68	0735	0.014[1]	0*	0*	1	6.9	0	0	4	0	0.0*	0.0*	0.0*	0.0*
231	07 24 68	1540	0.014[1]	2	3	3	7.0	0	0	4	2	0.4	0.0	0.0	0.1
242	07 24 68	2225	0.014[1]	0*	0*	2	7.0	0	0	2	2	0.0	0.1	0.0	0.2
245	07 25 68	0435	0.014[1]	0*	0*	1	7.2	0	0	2	2	0.0	0.1	0.0	0.1
264	07 25 68	1135	0.014[1]	0*	0*	2	6.3	0	1	4	2	0.0	0.1	0.0	0.0
279	07 25 68	1940	0.014[1]	0*	0*	<1	6.9	0	0	3	1	0.0	0.0	0.0	0.0
286	07 26 68	0055	0.014[1]	0*	0*	<1	6.0	0	1	0	0	0.0*	0.0*	0.0*	0.0*
302	07 26 68	1400	0.014[1]	0*	0*	<1	7.2	0	0	2	0*	0.0*	0.0*	0.0*	0.0*

*=NO ANALYSIS
[1]VISUALLY ESTIMATED

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-5

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH 3

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	TS	NH3-N	TON	O-PO4	T-PO4
190	07 23 68	1030	0.000*	2340	4470	6675	6.8	0	4	2370	1920	0*	38.6	165.0	75.0	90.0
192	07 23 68	1430	0.000*	2700	4380	5445	10.4	390	0	1920	1190	0*	39.8	148.0	130.0	220.0
195	07 23 68	1740	0.000*	2080	3420	3490	9.7	140	0	1388	1132	0*	22.4	121.0	39.0	43.5
199	07 23 68	2210	0.000*	1920	3660	4060	9.4	120	0	1356	1100	0*	11.2	31.8	23.5	31.0
204	07 24 68	0227	0.000*	2570	4260	7235	6.2	0	20	9970	2650	0*	19.3	218.7	86.5	118.0
207	07 24 68	0730	0.914	1920	2820	3085	10.7	250	0	1446	238	0*	2.8	67.2	88.0	150.0
212	07 24 68	0905	1.307	2460	3090	4697	9.0	130	0	1060	216	0*	84.0	59.8	51.5	143.0
230	07 24 68	1435	1.129	1415	1850	2475	6.4	0	10	222	170	0*	34.2	24.1	25.2	43.0
237	07 24 68	2020	1.048	756	1200	1602	6.8	0	4	668	542	0*	16.5	12.9	2.2	5.1
238	07 24 68	2340	1.134	1125	1740	1760	10.8	320	0	160	76	0*	19.0	16.0	3.7	5.7
239	07 25 68	0425	2.289	960	2760	3875	12.0	5260	0	9450	1530	0*	14.5	110.7	25.3	20.5
240	07 25 68	0520	1.330	900	1164	1475	9.8	130	0	1358	262	0*	8.1	22.3	14.0	20.0
263	07 25 68	1140	1.065	2100	2970	4440	6.2	0	20	1450	1210	0*	32.2	95.2	57.0	82.0
267	07 25 68	1515	1.034	2570	3540	5930	5.5	0	92	8570	2270	0*	23.8	25.2	74.0	105.0
277	07 25 68	1930	1.072	1650	3080	3515	7.0	0	0	1140	870	0*	22.4	12.3	19.2	30.6
282	07 26 68	0030	1.362	4500	7470	10100	5.8	0	60	33030	4940	0*	124.5	14.7	85.0	197.0
284	07 26 68	0145	1.163	900	1482	2265	6.6	0	4	7656	1188	0*	132.0	35.0	24.0	66.5
289	07 26 68	0730	1.229	1224	1590	2380	2.0	0	1100	910	134	0*	28.0	69.5	5.3	14.8
301	07 26 68	1240	0.612	2700	3390	4230	5.8	0	104	1036	792	0*	89.0	126.0	98.0	143.0
316	07 26 68	1655	0.737	2790	4560	6080	5.3	0	180	3068	1620	0*	14.0	28.0	90.0	143.0
320	07 26 68	1900	0.714	2940	5370	5550	5.2	0	130	3428	1566	0*	28.0	194.0	21.5	97.0
323	07 26 68	2300	1.120	3990	7200	9260	5.7	0	100	8320	2668	0*	5.6	19.6	55.0	57.5
327	07 27 68	0238	2.052	1355	2220	3610	6.0	0	40	2036	896	0*	20.2	125.0	25.0	26.0
330	07 27 68	0805	1.221	5820	7320	0*	5.3	0	290	132	44	0*	22.4	26.0	7.0	8.6
333	07 27 68	1045	1.435	2020	3580	5930	2.8	0	500	3384	1294	0*	20.2	95.0	106.0	220.0
335	07 27 68	1325	1.045	9600	13800	15180	5.6	0	280	2104	1196	21277	13.4	39.8	97.5	165.0
339	07 27 68	1900	1.483	2610	4500	5455	5.2	0	110	3624	1948	0*	16.2	22.4	28.5	57.0
342	07 27 68	2310	1.346	3390	4620	5970	5.5	0	72	2480	1020	0*	14.0	113.0	35.0	46.5
344	07 28 68	0110	1.221	2850	4500	4720	5.4	0	90	6176	1504	0*	11.2	156.0	47.5	75.0
346	07 28 68	0830	1.432	4320	4920	6915	6.0	0	94	1804	620	0*	30.8	139.0	300.0	350.0
350	07 28 68	1225	1.275	9180	10550	13080	5.2	0	130	4192	1588	9693	16.8	197.0	36.0	66.0
353	07 28 68	1440	1.370	1980	4380	5980	5.7	0	54	3582	1496	0*	16.2	171.0	24.0	35.0
357	07 28 68	1950	1.284	1920	4440	5130	5.5	0	86	4484	1606	0*	29.1	186.0	28.0	32.0
359	07 28 68	2205	1.189	3480	4550	7010	5.8	0	100	7174	2228	0*	16.8	208.0	72.0	120.0
362	07 29 68	0335	1.512	1920	4800	5375	6.0	0	82	3028	1266	0*	36.5	210.0	29.0	41.0
364	07 29 68	0600	1.175	2700	5520	5890	5.8	0	80	6800	1320	0*	0.1	240.0	38.0	43.0
367	07 29 68	0920	1.519	1500	2250	4583	6.0	0	60	2074	1094	0*	5.6	6.7	105.0	145.0
375	07 29 68	1335	1.296	2040	5280	5795	5.6	0	100	3516	1808	0*	44.8	219.0	37.0	56.0
377	07 29 68	1820	1.208	2520	6060	6710	5.6	0	110	5328	2706	0*	6.7	271.0	34.0	38.0
381	07 29 68	2135	1.275	2580	5640	6773	6.8	0	4	3894	2138	0*	38.6	0.1	35.0	41.0
383	07 30 68	0338	1.091	4320	8700	9270	8.0	80	0	3212	1664	0*	44.8	235.0	27.0	41.0
386	07 30 68	0650	1.284	3060	4740	5820	7.7	16	0	4026	1486	0*	43.0	184.0	29.0	40.0

*=NO ANALYSIS

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-6

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 3

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	TS	NH3-N	TON	O-PO4	T-PO4
190	07 23 68	1030	0.000*	0*	0*	0*	6.8	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
192	07 23 68	1430	0.000*	0*	0*	0*	10.4	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
195	07 23 68	1740	0.000*	0*	0*	0*	9.7	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
199	07 23 68	2210	0.000*	0*	0*	0*	9.4	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
204	07 24 68	0227	0.000*	0*	0*	0*	6.2	0*	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
207	07 24 68	0730	0.914	14625	21480	23498	10.7	1904	0	11014	1813	0*	21.3	511.8	670.3	1142.5
212	07 24 68	0905	1.307	26793	33655	51158	9.0	1416	0	11545	2353	0*	914.9	651.3	560.9	1557.5
230	07 24 68	1435	1.129	13307	17398	23275	6.4	0	94	2088	1599	0*	321.6	226.6	236.9	404.3
237	07 24 68	2020	1.048	6602	10479	13989	6.8	0	35	5833	4733	0*	144.0	112.6	19.2	44.5
238	07 24 68	2340	1.134	10634	16447	16636	10.8	3025	0	1512	718	0*	179.6	151.2	34.9	53.8
239	07 25 68	0425	2.289	18309	52640	73905	>12.0	100321	0	180234	29181	0*	276.5	2111.3	482.5	390.9
240	07 25 68	0520	1.330	9975	12901	16348	9.8	1441	0	15051	2904	0*	89.7	247.1	155.1	221.6
263	07 25 68	1140	1.065	18641	26363	39411	6.2	0	178	12871	10740	0*	285.8	845.0	505.9	727.8
267	07 25 68	1515	1.034	22134	30488	51072	5.5	0	792	73810	19550	0*	204.9	217.0	637.3	904.3
277	07 25 68	1930	1.072	14745	27524	31411	7.0	0	0	10188	7775	0*	200.1	109.9	171.5	273.4
282	07 26 68	0030	1.362	51064	84765	114609	5.8	0	681	374806	56056	0*	1412.7	166.8	964.5	2235.4
284	07 26 68	0145	1.163	8723	14364	21953	6.6	0	39	74203	11514	0*	1279.3	339.2	232.6	644.5
289	07 26 68	0730	1.229	12539	16288	24380	<2.0	0	11268	9322	1373	0*	286.8	711.9	54.3	151.6
301	07 26 68	1240	0.612	13764	17282	21564	5.8	0	530	5281	4038	0*	453.7	642.3	499.6	729.0
316	07 26 68	1655	0.737	17135	28005	37341	5.3	0	1105	18842	9949	0*	85.9	171.9	552.7	878.2
320	07 26 68	1900	0.714	17492	31949	33020	5.2	0	773	20395	9317	0*	166.6	1154.2	127.9	577.1
323	07 26 68	2300	1.120	37236	67192	86417	5.7	0	933	77644	24898	0*	52.2	182.9	513.2	536.6
327	07 27 68	0238	2.052	23161	37947	61706	6.0	0	684	34802	15315	0*	345.2	2136.6	427.3	444.4
330	07 27 68	0805	1.221	59201	74458	0*	5.3	0	2950	1343	448	0*	227.8	264.4	71.2	87.4
333	07 27 68	1045	1.435	24158	42814	70918	2.8	0	5980	40470	15475	0*	241.5	1136.1	1267.6	2631.0
335	07 27 68	1325	1.045	83602	120177	132195	5.6	0	2438	18323	10415	185291	116.7	346.6	849.0	1436.9
339	07 27 68	1900	1.483	32247	55598	67397	5.2	0	1359	44775	24068	0*	200.1	276.7	352.1	704.2
342	07 27 68	2310	1.346	38021	51816	66957	5.5	0	808	27814	11440	0*	157.0	1267.3	392.5	521.5
344	07 28 68	0110	1.221	28990	45774	48011	5.4	0	915	62822	15299	0*	113.9	1586.8	483.1	762.9
346	07 28 68	0830	1.432	51560	58721	82532	6.0	0	1122	21531	7400	0*	367.6	1659.0	3580.5	4177.3
350	07 28 68	1225	1.275	97563	112123	139011	5.2	0	1382	44551	16877	103015	178.5	2093.6	382.6	701.4
353	07 28 68	1440	1.370	22610	50017	68288	5.7	0	617	40904	17083	0*	185.0	1952.7	274.0	399.6
357	07 28 68	1950	1.284	20543	47507	54890	5.5	0	920	47977	17184	0*	311.3	1990.1	299.6	342.4
359	07 28 68	2205	1.189	34480	45082	69455	5.8	0	991	71080	22075	0*	166.4	2060.8	713.3	1188.9
362	07 29 68	0335	1.512	24182	60456	67698	6.0	0	1033	38138	15945	0*	459.7	2644.9	365.2	516.4
364	07 29 68	0600	1.175	26428	54030	57652	5.8	0	783	66559	12920	0*	0.9	2349.1	371.9	420.8
367	07 29 68	0920	1.519	18982	28474	57998	6.0	0	759	26246	13844	0*	70.8	84.7	1328.7	1834.9
375	07 29 68	1335	1.296	22023	57001	62561	5.6	0	1080	37958	19519	0*	483.6	2364.2	399.4	604.5
377	07 29 68	1820	1.208	25361	60988	67529	5.6	0	1107	53621	27233	0*	67.4	2727.3	342.1	382.4
381	07 29 68	2135	1.275	27420	59940	71982	6.8	0	43	41384	22722	0*	410.2	1.0	371.9	435.7
383	07 30 68	0338	1.091	39279	79103	84286	8.0	727	0	29205	15130	0*	407.3	2136.7	245.5	372.7
386	07 30 68	0650	1.284	32741	50717	62272	7.7	171	0	43077	15900	0*	460.0	1968.7	310.3	427.9

*=NO ANALYSIS

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-7

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH 4

ID	DATE	TIME	SAMPLING PERIOD, HRS.	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
305	07 26 68	1440	grab	0.288[1]	0*	0*	2392	6.6	0	12	264	242	0.0*	0.0*	0.0*	0.0*
317	07 26 68	1630	2.0	0.019[1]	24	31	93	3.3	0	64	44	44	0.0*	0.0*	0.0*	0.0*
337	07 27 68	1340	6.1	0.019[1]	0*	0*	111	6.3	0	20	54	8	4.2	91.8	0.0*	0.0*
352	07 28 68	1415	5.9	0.007	90	132	383	3.4	0	420	44	28	4.2	12.1	0.0*	0.0*
374	07 29 68	1410	4.5	0.031	276	282	288	6.6	0	12	174	112	3.4	17.3	110.0	157.0

TABLE BL-8

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 4

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
305	07 26 68	1440	0.288[1]	0*	0*	5738	6.6	0	29	633	581	0.0*	0.0*	0.0*	0.0*
317	07 26 68	1630	0.019[1]	4	5	15	3.3	0	10	7	7	0.0*	0.0*	0.0*	0.0*
337	07 27 68	1340	0.019[1]	0*	0*	18	6.3	0	3	9	1	0.6	14.6	0.0*	0.0*
352	07 28 68	1415	0.007	6	8	23	3.4	0	26	3	2	0.2	0.7	0.0*	0.0*
374	07 29 68	1410	0.031	71	73	74	6.6	0	3	45	29	0.8	4.4	28.3	40.5

*=NO ANALYSIS
[1]ESTIMATED

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-9

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH 5

ID	DATE	TIME	SAMPLING PERIOD, HRS.	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
307	07 26 68	1345	grab	0.303	0*	0*	1458	7.0	0	0	238	230	0.0*	0.0*	0.0*	0.0*
321	07 26 68	2140	8.0	0.240	696	810	1056	7.0	0	0	316	98	4.2	52.0	11.0	15.0
331	07 27 68	0715	9.6	0.167	102	117	139	7.2	6	0	34	0	0.0*	0.0*	0.0*	0.0*
340	07 27 68	1910	11.9	0.159	342	612	1148	6.2	0	20	0*	0*	0.0*	0.0*	0.0*	0.0*
347	07 28 68	0850	13.7	0.131	0*	0*	2016	8.6	96	0	46	0	0.0*	0.0*	0.0*	0.0*
355	07 28 68	1900	10.2	0.030	3	9	19	9.7	10	0	66	10	0.0*	0.0*	0.0*	0.0*
363	07 29 68	0550	10.9	0.134	0*	0*	149	6.9	0	3	28	0	0.0*	0.0*	0.0*	0.0*
368	07 29 68	0950	4.0	0.000*	150	192	343	6.8	0	6	66	26	19.0	11.2	29.0	39.0
372	07 29 68	1315	3.5	0.000*	192	240	490	9.0	92	0	184	84	18.5	14.8	27.0	47.0
378	07 29 68	1830	5.3	0.164	234	282	500	8.7	64	0	126	64	21.8	13.4	23.0	26.0
379	07 29 68	1830	grab	0.170	0*	0*	3630	7.7	26	0	12	0	0.0*	0.0*	0.0*	0.0*
382	07 30 68	0330	9.0	0.159	348	540	636	9.3	104	0	46	12	0.1	4.5	1.0	4.0
387	07 30 68	0900	5.5	0.154	624	888	930	9.3	90	0	202	164	0.1	3.6	12.0	13.0

TABLE BL-10

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 5

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
307	07 26 68	1345	0.303	0*	0*	3690	7.0	0	0	602	582	0.0*	0.0*	0.0*	0.0*
321	07 26 68	2140	0.240	1394	1623	2115	7.0	0	0	633	196	8.4	104.1	22.0	30.0
331	07 27 68	0715	0.167	142	163	193	7.2	8	0	47	0	0.0*	0.0*	0.0*	0.0*
340	07 27 68	1910	0.159	455	815	1529	6.2	0	27	0*	0*	0.0*	0.0*	0.0*	0.0*
347	07 28 68	0850	0.131	0*	0*	2201	8.6	105	0	50	0	0.0*	0.0*	0.0*	0.0*
355	07 28 68	1900	0.030	1	2	5	9.7	3	0	17	3	0.0*	0.0*	0.0*	0.0*
363	07 29 68	0550	0.134	0*	0*	166	6.9	0	3	31	0	0.0*	0.0*	0.0*	0.0*
368	07 29 68	0950	0.000*	0*	0*	0*	6.8	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
372	07 29 68	1315	0.000*	0*	0*	0*	9.0	0*	0*	0*	0*	0.0*	0.0*	0.0*	0.0*
378	07 29 68	1830	0.164	320	386	684	8.7	88	0	172	88	29.8	18.3	31.4	35.5
379	07 29 68	1830	0.170	0*	0*	5138	7.7	37	0	17	0	0.0*	0.0*	0.0*	0.0*
382	07 30 68	0330	0.159	463	719	847	9.3	138	0	61	16	0.1	6.0	1.3	5.3
387	07 30 68	0900	0.154	801	1140	1194	9.3	116	0	259	210	0.1	4.6	15.4	16.6

*=NO ANALYSIS

BRISTOL LABORATORIES
SYRACUSE, NEW YORK

TABLE BL-11

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH 7

ID	DATE	TIME	SAMPLING PERIOD, HRS.	FLOW	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
198	07 23 68	1800	3.2	0.259	123	7.0	0	0	8	0*	0.0*	0.0*	0.0*	0.0*
203	07 24 68	0245	8.8	0.318	215	7.0	0	0	14	0	0.0*	0.0*	0.0*	0.0*
209	07 24 68	0745	grab	0.338	56	7.0	0	0	16	0	0.0*	0.0*	0.0*	0.0*
2	07 24 68	1525	7.3	0.229	28	7.2	2	0	36	0*	0.0*	0.0*	0.0*	0.0*
241	07 24 68	1945	6.0	0.278	28	7.0	0	0	28	16	0.1	2.2	5.5	11.2
243	07 24 68	2240	7.6	0.262	1272	7.2	2	0	28	18	0.1	2.2	5.0	7.9
246	07 25 68	0440	5.2	0.283	617	6.9	0	1	32	18	0.1	1.7	5.0	7.5
265	07 25 68	1205	6.9	0.257	10	6.8	0	2	34	0*	0.0*	0.0*	0.0*	0.0*
280	07 25 68	1945	5.6	0.237	454	6.4	0	6	10	10	0.1	0.1	7.5	9.2
287	07 26 68	0100	24.2	0.230	28	6.6	0	4	16	16	0.0*	0.0*	0.0*	0.0*
303	07 26 68	1115	22.7	0.230	122	7.0	0	0	12	0*	0.0*	0.0*	0.0*	0.0*

TABLE BL-12

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 7

ID	DATE	TIME	FLOW	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
198	07 23 68	1800	0.259	266	15.1	0	0	17	0*	0.0*	0.0*	0.0*	0.0*
203	07 24 68	0245	0.318	570	18.5	0	0	37	0	0.0*	0.0*	0.0*	0.0*
209	07 24 68	0745	0.338	158	19.7	0	0	45	0	0.0*	0.0*	0.0*	0.0*
232	07 24 68	1525	0.229	53	13.7	4	0	69	0*	0.0*	0.0*	0.0*	0.0*
241	07 24 68	1945	0.278	65	16.2	0	0	65	37	0.2	5.1	12.7	25.9
243	07 24 68	2240	0.262	2777	15.7	4	0	61	39	0.2	4.8	10.9	17.2
246	07 25 68	0440	0.283	1458	16.3	0	1	76	43	0.2	4.0	11.8	17.7
265	07 25 68	1205	0.257	21	14.6	0	2	73	0*	0.0*	0.0*	0.0*	0.0*
280	07 25 68	1945	0.237	899	12.6	0	6	20	20	0.2	0.2	14.8	18.2
287	07 26 68	0100	0.230	54	12.6	0	4	31	31	0.0*	0.0*	0.0*	0.0*
303	07 26 68	1115	0.230	234	13.4	0	0	23	0*	0.0*	0.0*	0.0*	0.0*

*=NO ANALYSIS

TABLE BL-13

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
IS IN MILLION GALLONS PER DAY
ATIONS ARE IN MILLIGRAMS PER LITER

MH 9

ID	DATE	TIME	SAMPLING PERIOD, HRS.	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
196	07 23 68	1745	3.2	0.009	0*	0*	160	6.6	0	4	32	0*	0.0*	0.0*	0.0*	0.0*
205	07 24 68	0235	8.8	0.010'	0*	0*	75	6.9	0	1	32	32	0.0*	0.0*	0.0*	0.0*
210	07 24 68	0755	grab	0.018'	0*	0*	140	6.9	0	1	52	48	0.0*	0.0*	0.0*	0.0*
244	07 24 68	2230	7.3	0.158'	0*	0*	47	7.5	5	0	50	20	<0.1	1.4	0.3	2.0
247	07 25 68	0430	6.0	0.014'	0*	0*	19	7.1	1	0	38	38	<0.1	1.7	0.2	2.1
278	07 25 68	1935	7.6	0.010'	0*	0*	185	6.4	0	6	56	26	0.1	<0.1	5.4	7.0
285	07 26 68	0045	5.2	0.007'	0*	0*	47	6.6	0	4	16	16	0.0*	0.0*	0.0*	0.0*
290	07 26 68	0740	6.9	0.010'	0*	0*	103	6.8	0	2	18	0*	1.4	2.8	6.4	9.4
304	07 26 68	1315	5.6	0.010'	33	42	47	6.4	0	6	26	0*	0.0*	0.0*	0.0*	0.0*
336	07 27 68	1330	24.2	0.011'	0*	0*	1084	6.8	0	2	52	14	0.0*	0.0*	0.0*	0.0*
351	07 28 68	1215	22.7	0.011'	0*	0*	224	6.2	0	8	164	34	0.0*	0.0*	0.0*	0.0*
369	07 29 68	0925	21.2	0.010'	30	42	84	6.8	0	2	40	0*	2.0	13.4	11.0	15.0

TABLE BL-14

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH 9

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL.	ACID.	SS	VSS	NH3-N	TON	O-PO4	T-PO4
196	07 23 68	1745	0.009	0*	0*	13	6.6	0	0	3	0*	0.0*	0.0*	0.0*	0.0*
205	07 24 68	0235	0.010'	0*	0*	6	6.9	0	0	3	3	0.0*	0.0*	0.0*	0.0*
210	07 24 68	0755	0.018'	0*	0*	22	6.9	0	0	8	7	0.0*	0.0*	0.0*	0.0*
244	07 24 68	2230	0.158'	0*	0*	62	7.5	7	0	66	26	<0.1	1.8	0.4	2.6
247	07 25 68	0430	0.014'	0*	0*	2	7.1	0	0	5	5	0.0	0.2	0.0	0.2
278	07 25 68	1935	0.010'	0*	0*	16	6.4	0	1	5	2	0.0	0.0	0.4	0.5
285	07 26 68	0045	0.007'	0*	0*	3	6.6	0	0	1	1	0.0*	0.0*	0.0*	0.0*
290	07 26 68	0740	0.010'	0*	0*	9	6.8	0	0	2	0*	0.1	0.2	0.5	0.8
304	07 26 68	1315	0.010'	3	4	4	6.4	0	1	2	0*	0.0*	0.0*	0.0*	0.0*
336	07 27 68	1330	0.011'	0*	0*	104	6.8	0	0	5	1	0.0*	0.0*	0.0*	0.0*
351	07 28 68	1215	0.011'	0*	0*	21	6.2	0	1	16	3	0.0*	0.0*	0.0*	0.0*
369	07 29 68	0925	0.010'	3	4	7	6.8	0	0	3	0*	0.1	1.1	0.9	1.2

*=NO ANALYSIS
'VISUALLY ESTIMATED

Burkhard Brothers, Inc.
203 Wavel Street
Syracuse, New York

MANUFACTURING PROCESSES

Burkhard Brothers, Inc., cleans, rebuilds, and paints machinery, and operates a machine shop. A total of 46 persons are employed on a 9-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The wastewater from this industry is predominantly sanitary, although a small amount of wastewater results from the condensed steam used for parts cleaning. An estimated 650 gallons per day of the total 800 gallons per day water usage are discharged from sanitary facilities to the Ley Creek Sewerage System. The effluent from the cleaning operation flows to subsurface disposal on the plant grounds.

SAMPLING AND ANALYSIS SURVEY

This wastewater was not sampled.

CONCLUSIONS

There is no industrial waste problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.
2. Continue subsurface disposal of above described process water as long as it remains adequate and appropriate.

Burnett Processes, Inc.
Court Street Road
Syracuse, New York

MANUFACTURING PROCESSES

Burnett Processes, Inc., cuts insulation (fiberglass and plastics) into parts for filters. Currently, 75 persons are employed at this plant on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

According to Burnett Processes, Inc., personnel, wastewater is limited to sanitary sources. An estimated 750 gallons per day are discharged to the Ley Creek Sewerage System.

The manufacturing processes are "dry". All scrap material is collected and hauled to land disposal.

SAMPLING AND ANALYSIS SURVEY

This wastewater was not sampled.

CONCLUSIONS

There appears to be no industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Frederick C. Burroughs & Son
2025 Teall Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Frederick C. Burroughs & Son is a small metal polishing and buffing shop, operating on a "job shop" basis. Only one person is employed.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater, limited to sanitary sources, is estimated at 10 gallons per day. It is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

This wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Canada Dry Bottling Company
300 Erie Boulevard East
Syracuse, New York

MANUFACTURING PROCESSES

Canada Dry Bottling Company bottles soft drinks of various flavors. Production was approximately 12,000 cases per week and is expected to increase to 16,000 cases per week. The plant normally operates 6 days per week, 8 hours per day, and employs 15 persons.

WASTEWATER PRODUCTION AND TREATMENT

The basic processes include bottle washing, syrup and carbonated water addition, and capping.

About 60 percent of the total production is bottled in returnable containers. These returned bottles are washed in a special machine. The debris (straws, cigarettes, etc.) removed from the containers are screened and removed along with broken glass to a dump. Wastewaters are generated in the bottle washing machine from production leaks, wash waters, and syrup make-up tank washwater.

The water used in soft drinks is pre-treated prior to being used. The plant water treatment system consists of chlorination and filtration through a sand, gravel, and coal media. The filter backwash waters are discharged to the sewer. Treated waters are dechlorinated before use in the bottling operations.

An estimated 150 gallons per day of sanitary wastewaters are discharged along with process wastewaters and filter backwash waters to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS PROGRAM

No wastewater samples were collected.

CONCLUSIONS

None of the wastewater sources observed during the plant visit appear to contribute excessive amounts (pounds) of organic contaminants. However, concentrations may occasionally exceed allowable discharge limits set forth in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Continue to discharge wastewaters to the Ley Creek Sewerage System.

Carrier Corporation
Carrier Parkway
Syracuse, New York

MANUFACTURING PROCESSES

Carrier Corporation produces a wide range of air conditioning and refrigeration equipment. In the basic operation raw metals are cut into parts, prepared, and fabricated into the final product. Unit processes include solvent degreasing, wet alkaline washing, paint spraying, machining, phosphatizing (zinc phosphate and acid treatment), and pickling. Production is on a two shift basis with a skeleton crew on the third shift. The normal work week is 5 days.

WASTEWATER PRODUCTION AND TREATMENT

The Carrier complex, located on Carrier Parkway, consists of approximately 20 buildings used for manufacturing, laboratories, offices, and other related facilities. Industrial wastewater is generated primarily in three buildings: TR-1, TR-2, and TR-3 (TR signifies Thompson Road). Other buildings in the complex were not inspected as Carrier personnel assured us that only minor quantities of similar process wastewaters are generated in these buildings.

All wastewaters, both industrial and sanitary, are combined in the main sanitary sewers and discharged to the Ley Creek Sewage Treatment Plant. The combined wastewater sewers are shown on Carrier Corporation Drawing No. PEP-TR-651D, "Main Sanitary Sewers." The separate storm sewer system for this plant is shown on Carrier's Drawing No. PEP-TR-654D, "Main Piping for Storm Sewer System." Storm waters are discharged to a creek running along Carrier's property. Both drawings are on file but are not appended.

Daily water usage was estimated by Carrier personnel at approximately 1.6 mgd. Of this total, cooling water requirements were estimated at 50 percent with the remainder used for sanitary and industrial requirements.

SAMPLING AND ANALYSIS SURVEY

A wastewater survey was conducted at the Carrier complex during the week of July 8, 1968. The combined sanitary-industrial sewers were sampled at two locations: 1) at a manhole located in the southwest corner of the Carrier complex next to Thompson Road and the railroad tracks, designated for ease of identification as Manhole A; and 2) at a manhole located on Kinnie Street, designated Manhole B. Selected stormwater outfalls also were sampled.

The majority of the sanitary-industrial wastewater is discharged through two branch sewers but combine at Manhole A. No location existed downstream of Manhole A where the well-mixed combined flow could be sampled. Therefore, grab and composite samples were collected from the common discharge pipe in Manhole A, after a minimal amount of mixing had occurred. The average flow at Manhole A was estimated over the sampling period by the lithium dilution technique. A known rate of a lithium chloride standard solution was continuously added to the wastewater in a manhole located outside of the cafeteria in Building TR-1. Lithium concentration measured in the wastewater sample allowed the calculation of the average flow rate over the sampling period.

Grab samples of the Carrier wastewater were taken at Manhole B as it discharged into the public sewer. Since the Carrier wastewater discharged at an elevation approximately three feet above the flow in the public sewer no cross contamination occurred. Flow was estimated at the time of each grab sample by the lithium dilution technique. The standard solution of lithium chloride was fed at a constant rate approximately 300 to 500 feet upstream from Manhole B.

The composite and grab samples taken from Manholes A and B were analyzed for BOD_5, BOD_{UC} (ultimate carbonaceous), COD, suspended solids, volatile suspended solids, pH, alkalinity or acidity, total chrome, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate. Raw and expanded (to pounds per day) data from the samples analyzed from Manhole A are shown in Tables CC-1 and CC-2, respectively. Analyses for the samples from Manhole B are shown in Tables CC-3 and CC-4 for the raw and extended data, respectively.

Approximately 18 stormwater outfalls from the Carrier Corporation discharge into a creek running parallel to Carrier Parkway and Kinnie Street. The first 9 outfalls starting at Carrier Circle and proceeding east around the Carrier property are numbered 1 through 9, while outfalls farther east were not numbered because very little flow and no contamination has ever been observed in them. Exact location of the outfalls can be seen on the drawing

"Main Piping for a Storm Sewer System." During the initial visit to this plant, contamination was observed in Outfalls No. 3, 4, and 7, both by ROY F. WESTON and Carrier personnel. During the sampling survey, all of the outfalls were again inspected. Only those that appeared to have contamination were sampled; Outfalls No. 2, 3, 7, and 8. The results of the storm water sampling and analysis survey on the selected outfalls are presented in Table 1.

DISCUSSION

A comparison of the contaminant discharge from Carrier Corporation (both Manholes A and B) to the influent of the Ley Creek Sewage Treatment Plant is shown on Table 2. Since contaminant levels for the Ley Creek Sewage Treatment Plant influent are the actual daily loadings, it was necessary to make the comparison on the same basis. Production areas (two 8-hour shifts) primarily discharge wastewaters through Manhole A, while the wastewaters in Manhole B are generally from offices and laboratory areas (one 8-hour shift). Therefore, the daily discharge is the sum of two-thirds the contaminants found in Manhole A and one-third the Manhole B contaminants. The instantaneous rate gives the minimum and maximum 24-hour values based on survey data (zero values are assumed for non-production periods). In the comparison, grab and composite samples were weighted equally.

When comparing mean values in Table 2, metals (chrome, copper, and zinc) discharged from Carrier are approximately 3 to 14 percent of those measured in the Ley Creek Sewage Treatment Plant influent. Although no apparent metal toxicity problem exists at the Ley Creek Sewage Treatment Plant, the concentrations of chromium and zinc indicate a potential for increased in-plant controls to reduce losses of these metals. In addition, pH values measured in most of the samples are lower than the acceptable limit of 5.5 as established under Section 3(f) of the Onondaga County "Rules and Regulations Governing the Use of Public Sewers." While not adversely affecting pH in the Ley Creek Sewage Treatment Plant, such pH (acidity) values potentially could cause sewer degradation problems.

Phosphate contamination in the wastewater is high and extremely variable with a measured maximum to minimum range of 35 to 1. On an instantaneous peak rate basis, Carrier contributes approximately 24 percent of the total phosphate measured in the Ley Creek Sewage Treatment Plant.

When the adjusted flows at Manholes A and B are added, the resulting flow (0.5 mgd) comprises 30 percent of the estimated water use of 1.6 mgd. Several factors may contribute to this discrepancy:

Table 1

Carrier Corporation

Analyses of Stormwater Sewer Discharge

Sewer No.	COD	SS	Total Iron	pH	Alkalinity/[1] Acidity
2	19	10	2.74	8.8	85
3	10	0	0.18	7.2	8
7	2056	—	—	6.9	8
8	—	—	0.42	7.4	33

[1] Equivalent $CaCO_3$ to pH 7.0.

Table 2

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Carrier Corporation		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate[3]
Flow (MGD)	13.7	14.0	8.7-18.8	.504	-	0.72-.97
BOD_5	51,073	47,791	15,354-202,419	301	-	243-846
BOD_{uc}	71,117	69,572	19,912-251,149	446	-	377-1411
COD	115,965	101,879	26,309-341,738	1115	-	894-2592
pH	-	7.0	6.0-8.8	-	-	2.0-5.7
Acidity	838	0	0-6,647	-	-	-
Alkalinity	1,320	0	0-23,091	0	-	-
SS	74,776	54,205	1,599-325,906	657	-	392-2271
VSS	36,362	29,468	- -106,011	344	-	173-1062
TS	-	-	-	-	-	-
Oil and Grease	10,326	8,634	2,602-22,496	-	-	-
Cyanide	8.71	1.99	0.09-95.98	-	-	-
Phenol	29.40	19.49	0.80-113.95	-	-	-
Chromium	39.91	30.37	10.19-198.87	3.5	-	2.9-14.2
Copper	34.65	32.48	9.09-76.22	1.01	-	0.7-3.4
Zinc	84.79	93.75	18.11-183.22	11.4	-	4.7-47.5
Cadmium	8.45	5.93	1.5-40.54	-	-	-
Nickel	16.22	15.59	2.05-38.19	-	-	-
NH_3	1,373.3	1,775.2	864.1-3,540.5	-	-	-
Org-N	3,278.2	3,111.4	979.6-6,822.2	-	-	-
Ortho-PO_4	3,244	2,957	727-15,294	505.7	-	229-3927
Total-PO_4	6,397	6,762	1,200-19,542	615.8	-	276-4669

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per 24 hour operating day; zero values are assumed for non-production hours.
[3]Rate of contaminant emission

1. The adjusted flow estimate is based on the premise that there is no flow during non-working shifts. However, if a significant amount of water is used during these shifts, it would not have been included in the adjusted flow and, hence, would contribute to the discrepancy.
2. Discussions with Carrier personnel indicated that roughly 50 percent of the water use is for cooling purposes and some fraction of this water is discharged to the storm water system. Any water discharged to the storm sewers would not be included in the estimated flow.
3. The lithium dilution method of flow measurement requires complete mixing of the lithium chloride stock solution with the total wastewater flow. Very little mixing of the two wastewater streams in Manhole A occurred, and the flow entering Manhole B appeared to receive a minimum amount of mixing. Lack of adequate mixing could result in underestimating the flow in these sewers.

It is significant that the average flow obtained during 24-hour composite samples taken at Manhole A on July 11, 1968 indicates a flow of 0.67 mgd. When this flow is added to the estimated flow in Manhole B, a total process wastewater flow of 0.88 mgd is obtained. Although this is still only 50 percent of the water use, Carrier personnel had previously estimated that 50 percent of its water use was for cooling, discharged to the stream, and hence would not be included in the survey. However, because observations made by ROY F. WESTON personnel indicated relatively low flow in the storm outfalls, this fraction was neglected.

CONCLUSIONS

As a result of the in-plant visits and the sampling and analyses survey, the following conclusions can be drawn:

1. Thirty to fifty percent of the influent flow could be accounted for in the wastewater survey.
2. The wastewaters exhibited low pH values and contained occasional high metal and phosphate concentrations.
3. Contaminated wastewater was observed in storm sewers discharging from Carrier Corporation.

RECOMMENDATIONS

Based on the above conclusions, the following recommendations are made.

1. Install flow measuring devices on the major wastewater sewers.
2. Remove contamination from the stormwater sewers.

3. Reduce the high metal concentrations to avoid potential toxicity problems at the Ley Creek Sewage Treatment Plant. In-plant studies should be conducted by Carrier Corporation to locate the source or sources of chrome and zinc.
4. Further develop the wastewater management and water conservation program, including sampling and analysis, to preclude the possibility of unknowingly discharging large quantities of metals or clean waters to the Ley Creek Sewage Treatment Plant. If and when such discharges occur, their source must be ascertained and such practices corrected. Clean waters should be discharged to the storm water system.

CARRIER CORPORATION
SYRACUSE, NEW YORK

TABLE CC-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH - A SAMPLES

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
097	07 09 68	0800	16.3	0.648[1]	36	54	213	3.6	0	136.0	40	20	0.37	0.08	0.63	0.00*	0.00*	41.0	52.5
099	07 09 68	1500	7.0	0.648[1]	66	75	378	4.0	0	130.0	186	144	0.36	0.53	2.10	0.00*	0.00*	70.0	85.0
105	07 10 68	0830	grab	0.505	48	78	175	5.6	0	30.0	102	56	0.65	0.22	4.90	0.00*	0.00*	34.0	40.0
114	07 10 68	1605	grab	0.751	105	165	287	5.0	0	110.0	112	62	0.45	0.23	2.10	0.00*	0.00*	25.0	27.0
123	07 11 68	1525	23.5	0.676	60	81	228	5.0	0	50.0	166	88	0.93	0.35	4.40	0.00*	0.00*	55.0	64.5
133	07 12 68	1620	25.0	0.648[1]	112	150	372	5.7	0	60.0	344	156	0.75	0.06	1.32	0.01	0.63	77.5	165.0

TABLE CC-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH - A SAMPLES

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
097	07 09 68	0800	0.648[1]	194	291	1150	3.6	0	734.1	216	108	1.99	0.43	3.40	0.00*	0.00*	221.3	283.3
099	07 09 68	1500	0.648[1]	356	405	2040	4.0	0	701.7	1004	777	1.94	2.86	11.33	0.00*	0.00*	377.8	453.8
105	07 10 68	0830	0.505	202	328	737	5.6	0	126.3	429	236	2.73	0.92	20.63	0.00*	0.00*	143.1	168.4
114	07 10 68	1605	0.751	657	1033	1797	5.0	0	688.7	701	388	2.81	1.44	13.15	0.00*	0.00*	156.5	169.0
123	07 11 68	1525	0.676	338	457	1285	5.0	0	281.8	936	496	5.24	1.97	24.80	0.00*	0.00*	310.0	363.6
133	07 12 68	1620	0.648[1]	605	810	2008	5.7	0	323.8	1857	842	4.04	0.32	7.12	0.05	3.40	418.3	890.6

*=NO ANALYSIS
[1]ESTIMATED

CARRIER CORPORATION
SYRACUSE, NEW YORK

TABLE CC-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MH - B SAMPLES

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	CR	COPPER	ZINC	O-PO4	T-PO4
100	07 09 68	1530	0.216'	30	48	87	2.0	0	550	128	38	5.00	0.30	12.60	1950.0	2100.0
106	07 10 68	0905	0.216'	27	90	165	5.3	0	50	98	46	0.95	0.21	0.71	48.0	60.0
124	07 11 68	1600	0.216'	105	210	307	5.2	0	126	116	36	0.52	0.21	0.79	102.0	115.0
134	07 12 68	1405	0.216'	105	165	194	5.5	0	34	230	122	3.05	0.22	2.60	67.0	103.0

TABLE CC-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MH - B SAMPLES

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	CR	COPPER	ZINC	O-PO4	T-PO4
100	07 09 68	1530	0.216'	54	86	157	2.0	0	990	230	68	8.99	0.54	22.67	3508.6	3778.4
106	07 10 68	0905	0.216'	49	162	297	5.3	0	90	176	83	1.71	0.37	1.28	86.3	107.9
124	07 11 68	1600	0.216'	189	378	552	5.2	0	227	209	65	0.93	0.37	1.42	183.5	206.9
134	07 12 68	1405	0.216'	189	297	349	5.5	0	61	414	220	5.48	0.39	4.67	120.5	185.3

*=NO ANALYSIS

'ESTIMATED

Cast-O-Matic Corporation
Wavel Street
Syracuse, New York

MANUFACTURING PROCESSES

The Cast-O-Matic Corporation die casts small aluminum and zinc parts from primary ingots obtained elsewhere. Drilling, tapping, and die trimming are included among its operations. A total of 70 persons are employed at this location on a two-shift per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is composed of two fractions; sanitary and cooling tower blowdown. Water use is approximately 3,500 gallons per day based upon previous water bills. Assuming a per capita sanitary usage of 20 gallons per day, the sanitary wastewater flow would be 1,400 gallons per day, leaving a cooling tower blowdown flow of 2,100 gallons per day. This calculated value is in excess of the estimates of blowdown quantities given by Cast-O-Matic personnel (20-30 gal/hour).

All wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

Industrial wastewater from this location should be compatible with biological treatment at the Ley Creek Sewage Plant. However, the potential for reduction in cooling water discharge may be present.

RECOMMENDATIONS

1. Continue to discharge the wastewater as described above to the Ley Creek Sewerage System.
2. A water use survey should be made by Cast-O-Matic Corporation to determine how much water is being used in cooling and whether this amount could be reduced or discharged to a storm sewer.

Chrysler Corporation
New Process Gear Division
Chrysler Drive
Syracuse, New York

MANUFACTURING PROCESSES

The New Process Gear Division of Chrysler Corporation manufactures standard automotive transmissions for truck and passenger cars. At the present time, the New Process Gear Division has two plants in Syracuse; the Wolf Street Plant and the Chrysler Drive Plant. The former manufactures finished transmission casings from purchased rough castings, while the latter manufactures gears from rough castings obtained elsewhere. The Chrysler Drive Plant also produces the assembled gear boxes and transmissions, using the Wolf Street casings and the Chrysler Drive Plant gears. The basic processes at the Chrysler Drive Plant include annealing, soft turning and cutting, parts washing, heat treating, and hard grinding of various sizes and shapes of metal.

Currently, both plants are in production 6-days per week, 24-hours per day. At the Chrysler Drive Plant, 994 persons are employed on the first shift, 350 on the second shift, and 170 on the third shift. The smaller Wolf Street Plant has 178 employees on the first shift, 95 on the second, and 28 on the third. Plans have been approved to phase out the Wolf Street Plant and to move all production to the larger facility, where the combined wastewater will be treated in an expanded, modernized treatment plant. After treatment, that wastewater will be discharged to the Ley Creek Sewage Treatment Plant.

WASTEWATER PRODUCTION AND TREATMENT

Total wastewater usage at the Chrysler Drive Plant varies between 200,000 and 275,000 gallons per day. Approximately 80,000 gallons per day of water are used in the once-through cooling water system, discharged in part to the sanitary sewer with the remainder to the storm sewer (surface disposal). The process wastewater, approximately 110,000 gallons per day, and sanitary wastewater, estimated at 15,000 - 30,000 gallons per day, are discharged to the combined sanitary-process sewer.

Process wastewater is contaminated with alkaline cleaners and soluble mineral and lubricating oils. The contaminated process wastewaters are treated in an on-site treatment system with alum flocculation and air flotation before discharge to the Ley Creek Sewage Treatment Plant System. The recovered oil is reprocessed. A flow diagram of the present treatment facilities has been placed in the file but is not appended to this report. When the Wolf Street facilities are combined with the present facilities at Chrysler Drive, the amount of process wastewater will be increased, although the general wastewater characteristics are not expected to change significantly. By that time, personnel at the New Process Gear Division anticipate completion of a new treatment facility, which will effectively treat the total process wastewater flow. Since discussions regarding this proposed wastewater treatment facility are still in progress between New Process Gear Division personnel and personnel from the Onondaga County Department of Public Works, these new facilities will not be discussed in this report. However, these proposed facilities are being designed to produce a wastewater quality that will comply with the Onondaga County sewer regulations of 28 February 1968 entitled "Rules and Regulations Governing the Use of Public Sewers."

SAMPLING AND ANALYSIS SURVEY

The sanitary-process wastewater discharge at the Chrysler Drive location was sampled at Manhole 2-S, as shown on Chrysler's Drawing S-2, "Site Plan and Miscellaneous Details" (dated 30 January 1964). A copy of this drawing has been included in the job file but has not been appended. A number of grab and composite samples were collected over various periods of time; concurrently, flow determinations were made by the lithium dilution technique. A standard solution of lithium chloride was introduced at a known rate into the sink discharge located just outside the doorway of the treatment plant room. After measuring the lithium concentration in the effluent samples, the flow rate over the sampling period was calculated. Average influent flow rates were calculated from the influent water meter readings taken at various time intervals by Chrysler personnel. Drawing No. 1 illustrates the average flow rates for the total influent water and the effluent sanitary/process wastewater. Samples collected from the sanitary-process sewer were analyzed for COD, suspended solids, volatile suspended solids, total solids, pH, alkalinity/acidity, oil and grease (total carbon tetrachloride extractable material), orthophosphate, and total phosphate.

The main storm sewer at the Chrysler Drive location was sampled at Manhole No. 4 as shown on Chrysler Drawing No. S-2. A number of grab samples were taken during the wastewater sampling survey. All samples were analyzed for COD, suspended solids, pH, alkalinity or acidity, and oil and grease (total carbon tetrachloride extractable material). Flow determinations were not attempted.

The storm sewer system from the Chrysler Drive Plant discharges to surface drainage which flows across Chrysler Drive, near the location of the Town of DeWitt Water Company and the Carrier Corporation water tower. This drainage was observed to contain a large amount of floating oil, which appeared to be an accumulation retained by weeds and other types of undergrowth present. However, the water flowing into this area appeared to contain oil contamination similar in concentration to that observed in Chrysler's storm sewer. The three grab samples collected were analyzed for COD, suspended solids, pH, alkalinity or acidity, and oil and grease (total carbon tetrachloride extractable materials). No flow determinations were made.

DISCUSSION

Raw data from the analyses of samples collected from the sanitary-process sewer are shown in Table NPG-1, and the data expanded to pounds per day are shown in Table NPG-2. Based upon this data, a comparison between Chrysler's wastewater discharge and the total loading to the Ley Creek Sewage Treatment Plant was made. Grab and composite samples from Chrysler were weighted equally. The comparison of mean values, shown in Table 1, indicates that Chrysler contributes approximately 1.8 percent of the oil and grease (carbon tetrachloride extractables) entering the Ley Creek Sewage Treatment Plant. Although this is not a significant portion of the Ley Creek Sewage Treatment Plant loading, the median oil concentration (205 mg/L) discharged during the survey from Chrysler exceeded the limit established in Section 3(b) of Onondaga County's "Rules and Regulations Governing the Use of Public Sewers."

Analyses of the storm sewer samples, shown in Table NPG-3, revealed high organic (COD) and solids concentrations on at least two occasions. These appear to be higher than normal for storm sewer discharges. Furthermore, oil and grease was observed in every sample taken, with the oil concentration varying from 1.8 to 9.2 mg/L, which is also higher than would be expected in a stormwater.

Raw data on the three grab samples collected from the surface drainage along Chrysler Drive are shown in Table NPG-4. High COD and oil concentrations (up to 3,840 mg/L COD and 686 mg/L Oil) were observed in the first and third samples, collected in a quiescent area of the stream where oil might be expected to accumulate. The second sample was taken from a more turbulent area and should be more representative of wastewater quality.

CONCLUSIONS

Based upon our initial plant visit and the result of our wastewater sampling survey, the following conclusions may be drawn:

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Chrysler Corporation		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	.113	.108	0.069-0.167
BOD_5	51,073	47,791	15,354-202,419	-	-	-
BOD_{uc}	71,117	69,572	19,912-251,149	-	-	-
COD	115,965	101,879	26,309-341,738	698	624	178-1438
pH	-	7.0	6.0-8.8	-	6.6	4.0-7.7
Acidity	838	0	0-6,647			
Alkalinity	1,320	0	0-23,091			
SS	74,776	54,205	1,599-325,906	258	217	63-715
VSS	36,362	29,468	- -106,011	215	190	52-549
TS	-	-	-	633	531	345-1196
Oil and Grease	10,326	8,634	2,602-22,496	187.8	163	13.8-584.2
Cyanide	8.71	1.99	0.09-95.98	-	-	-
Phenol	29.40	19.49	0.80-113.95	-	-	-
Chromium	39.91	30.37	10.19-198.87	-	-	-
Copper	34.65	32.48	9.09-76.22	-	-	-
Zinc	84.79	93.75	18.11-183.22	-	-	-
Cadmium	8.45	5.93	1.5-40.54	-	-	-
Nickel	16.22	15.59	2.05-38.19	-	-	-
NH_3	1,373.3	1,775.2	864.1-3,540.5	-	-	-
Org-N	3,278.2	3,111.4	979.6-6,822.2	-	-	-
Ortho-PO_4	3,244	2,957	727-15,294	30.2	12.4	8.1-204.4
Total-PO_4	6,397	6,762	1,200-19,542	46.6	25.8	13.6-204.4

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

1. The carbon tetrachloride extractable material (oil and grease) in the sanitary-process sewer exceeds allowable discharge limits.
2. Wastewater in the storm sewer contains carbon tetrachloride extractable material. Organics and suspended solids materials are also present on occasion.

RECOMMENDATIONS

1. Remove the sources of oil, organics, and solids presently discharging into the storm sewer system.
2. Treat all wastewater containing carbon tetrachloride extractable material as required to comply with the established sewer discharge requirements set forth by the Onondaga County Department of Public Works on 28 February 1968.

CHRYSLER CORPORATION
NEW PROCESS GEAR DIVISION
SYRACUSE, NEW YORK

TABLE NPG-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

SANITARY PROCESS SEWER DIS.

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	TS	VSS	OIL	O-PO4	T-PO4
426	08 12 68	1205	grab	0.108	388	7.4	12	0	204	590	156	40.2	13.6	63.5
427	08 12 68	1520	3.1	0.069	310	6.8	0	6	110	599	90	24.1	16.0	45.0
431	08 12 68	1920	4.0	0.108	765	7.4	12	0	328	0*	270	223.0	12.7	39.7
435	08 13 68	1100	1.5	0.102	750	6.8	0	6	266	622	236	222.3	240.0	240.0
440	08 14 68	0400	12.0	0.072	1920	6.6	0	12	538	903	498	273.0	21.0	38.5
444	08 14 68	1528	5.1	0.128	1272	6.6	0	12	410	767	360	316.0	20.6	38.0
446	08 14 68	2300	7.4	0.103	705	6.6	0	12	132	544	132	188.0	12.0	28.6
447	08 15 68	0923	grab	0.108	210	6.6	0	12	88	482	58	31.6	11.4	15.2
449	08 15 68	0910	10.2	0.167	324	5.8	0	50	86	601	70	93.0	9.6	18.6
451	08 15 68	1515	2.9	0.108	952	7.7	40	0	432	1329	344	440.0	21.5	41.5
456	08 16 68	0854	grab	0.108	550	6.1	0	12	230	0*	198	134.0	9.0	16.0
464	08 19 68	1500	5.9	0.155	1110	4.0	0	99	552	0*	424	451.0	52.2	82.5
468	08 20 68	0800	16.7	0.087	1090	5.8	0	24	344	0*	312	238.0	17.8	31.4
476	08 21 68	0800	16.0	0.155	440	0.0*	0*	0*	156	0*	122	72.6	7.1	15.5

TABLE NPG-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

SANITARY PROCESS SEWER DIS.

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	TS	VSS	OIL	O-PO4	T-PO4
426	08 12 68	1205	0.108	349	7.4	11	0	184	531	140	36.1	12.2	57.1
427	08 12 68	1520	0.069	178	6.8	0	3	63	345	52	13.8	9.2	25.9
431	08 12 68	1920	0.108	688	7.4	11	0	295	0*	243	200.6	11.4	35.7
435	08 13 68	1100	0.102	639	6.8	0	5	227	530	201	189.3	204.4	204.4
440	08 14 68	0400	0.072	1152	6.6	0	7	323	542	299	163.7	12.6	23.1
444	08 14 68	1528	0.128	1358	6.6	0	13	438	819	384	337.3	22.0	40.5
446	08 14 68	2300	0.103	609	6.6	0	10	114	470	114	162.3	10.3	24.7
447	08 15 68	0923	0.108	189	6.6	0	11	79	434	52	28.4	10.2	13.6
449	08 15 68	0910	0.167	451	5.8	0	70	120	836	97	129.4	13.3	25.8
451	08 15 68	1515	0.108	856	7.7	36	0	389	1196	309	395.8	19.3	37.3
456	08 16 68	0854	0.108	495	6.1	0	11	207	0*	178	120.5	8.1	14.4
464	08 19 68	1500	0.155	1438	4.0	0	128	715	0*	549	584.2	67.6	106.8
468	08 20 68	0800	0.087	798	5.8	0	18	252	0*	228	174.1	13.0	22.9
476	08 21 68	0800	0.155	570	0.0*	0*	0*	202	0*	158	94.0	9.2	20.0

*=NO ANALYSIS

CHRYSLER CORPORATION
NEW PROCESS GEAR DIVISION
SYRACUSE, NEW YORK

TABLE NPG-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

STORM SEWER DISCHARGE

ID	DATE	TIME	COD	PH	ALKAL	ACID	SS	OIL
437	08 13 68	1522	<10	7.0	0	0	18	4.1
439	08 14 68	1024	<10	7.2	4	0	8	9.2
448	08 15 68	1010	38	6.6	0	8	8	5.7
459	08 16 68	1558	30	6.7	0	6	44	2.6
465	08 19 68	1508	50	6.3	0	10	194	2.2
469	08 20 68	0815	188	6.6	0	8	38	2.6
477	08 21 68	0840	10	0.0*	0*	0*	10	1.8

TABLE NPG-4

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

STREAM ON CHRYSLER DRIVE

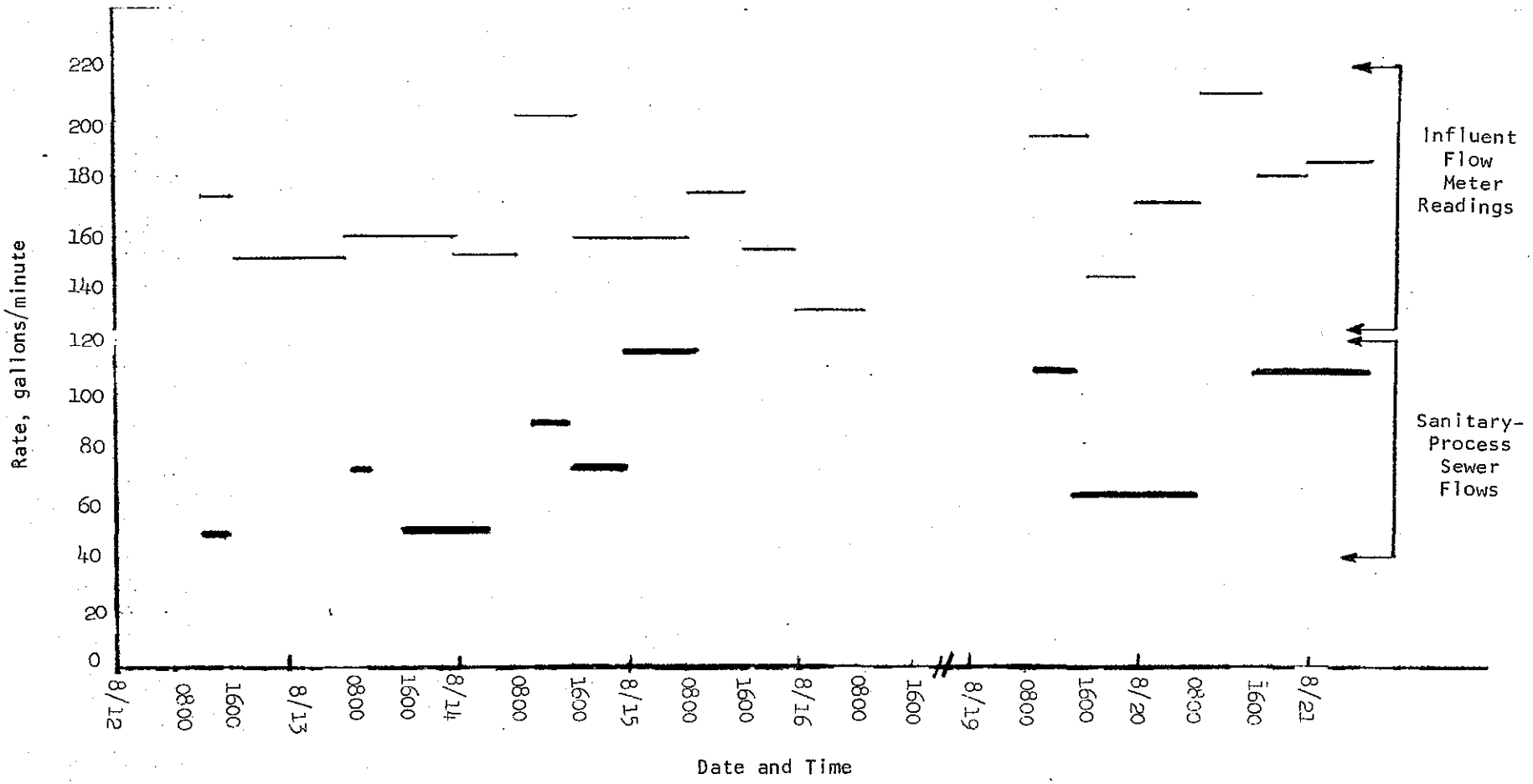
ID	DATE	TIME	COD	PH	ALKAL	ACID	SS	OIL
432	08 13 68	1140	700	7.3	0*	0	150	0.0*
436	08 13 68	1602	39	7.0	0	0	26	13.4
460	08 16 68	1530	>3840	6.3	0	10	0*	686.0

*=NO ANALYSIS
CONTAINED A SIGNIFICANT PORTION OF FLOATING OIL

Drawing 1

Chrysler Corporation
New Process Gear Division
Syracuse, New York

Comparison of Influent Flow Meter Readings
and
Sanitary-Process Sewer Flows



Clicquot Club Bottling Company
New Court Street
Syracuse, New York

MANUFACTURING PROCESSES

The Clicquot Club Bottling Company bottles approximately 400 cases of soft drinks per day. Production processes include bottle cleaning, syrup make-up, carbonated water addition, and capping. Currently, seven persons are employed, working one shift per day, five days per week. Based on previous water bills, this plant uses approximately 5,000 gallons of water per day. A large fraction of this water is used in the soft drinks make-up.

WASTEWATER PRODUCTION AND TREATMENT

One of the principal sources of wastewater at this plant is the bottle cleaning operation. Bottles are washed in an automated machine to which a detergent has been added. After the debris has been screened out, the washwaters are reused until dumped to the drainage sewer. All spillage and floor and equipment clean-up water are dumped to the sewer. Water is pretreated before being used in the bottling operation. Filter backwash is discharged to the sewer.

All process wastewaters drain to the rear of the property where they percolate into the ground or drain into Ley Creek.

An estimated 70 gallons per day of sanitary wastewaters are discharged via a separate sewer to an on-site septic tank and tile field system.

SAMPLING AND ANALYSIS PROGRAM

No wastewater samples were collected.

CONCLUSIONS

These wastewaters are a source of pollution to Ley Creek and as such should be discharged to a treatment system.

RECOMMENDATIONS

1. Treat contaminated process wastewaters prior to discharge to Ley Creek or discharge effluent to the Ley Creek Sewerage System.
2. Continue to discharge sanitary wastewaters to the septic tank as long as this system is adequate and appropriate.

T. A. Colucci Printing Company
Kane Street at Burnet Avenue
East Syracuse, New York

MANUFACTURING PROCESSES

The T. A. Colucci Printing Company produces various types of printed forms. Currently, 20 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is produced from sanitary sources and from machine cooling. The total water usage is approximately 500 gallons/day. Solvents and oil wastes are collected on rags, which are subsequently dry-cleaned.

All wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge the sanitary wastewater to the Ley Creek Sewerage System.

Continental Can Company
911 Hiawatha Boulevard, East
Syracuse, New York

MANUFACTURING PROCESSES

Continental Can Company manufactures various sizes and shapes of corrugated shipping containers. Corrugated boards are made in a continuous process by "sandwiching" corrugated paper between two layers of plain brown paper. The boards are held together by gluing the layers of paper. The paper boards are cut to required sizes.

Currently, 90 persons are employed on the first shift and 50 on the second shift. The plant normally operates 5 days per week. Although a new plant is now under construction at another site, it will be at least two years before production can be transferred to the new location.

WASTEWATER PRODUCTION AND TREATMENT

Based upon previous water bills, Continental Can uses approximately 22,000 gallons per day of water. The majority of this water is discharged as once-through cooling water to a drainage ditch located in the rear of the plant.

The principal wastewater source originates from operation and general clean-up of the corrugating machine. Wastewaters appear to be contaminated with both glue (starch) and oil. At the time of the initial visit, wastewaters from the corrugating machine were collected in a sump, located in the basement, and pumped to the drainage ditch. Oil spills and leaks from the basement storage area were also collected in this sump and discharged to the drainage ditch. The exact destination of this drainage ditch was not determined; however, the wastewater flowed in the direction of Ley Creek which was located only a short distance away.

An estimated 1,400 gpd of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS PROGRAM

The wastewater was not sampled.

CONCLUSIONS

Wastewater from the corrugating machine area appears to be contaminated with starch and oils. This wastewater should not be discharged to the drainage ditch.

RECOMMENDATIONS

1. Segregate and continue to discharge cooling water to the drainage ditch.
2. Collect contaminated wastewaters and discharge to the Ley Creek Sewerage System.

E. F. Cook Company
Dippold Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The E. F. Cook Company is a "job shop" machining company employing 5 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The wastewater is limited to sanitary sources. Total water usage is estimated at 50 gallons/day. All wastewater is discharged to a septic tank system located on the plant grounds.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge the sanitary wastewaters to the septic tank as long as this system is adequate and appropriate.

Corenco Corporation
(Formerly Syracuse Rendering Co.)
2621 Erie Boulevard East
East Syracuse, New York

MANUFACTURING PROCESSES

The Corenco Corporation renders grease, waste fat, and bones to meat and bone meal. The plant has 58 employees and operates 24 hours per day, six days a week.

A schematic diagram of the dry rendering process used at Corenco is on file but has not been included in this report. In brief, the raw materials, which are received in barrels are placed in steam jacketed cookers and heated under pressure. The cookers are subsequently drained; and the tallow and meat scraps separated, purified, and stored. Cooking vapors, drawn off by means of a barometric condenser, are then passed through a recirculating scrubber.

WASTEWATER PRODUCTION AND TREATMENT

The major sources of process wastewater are the barrel wash area, overflow from cooking vapor scrubbing system, floor washing, and tank and process equipment drainage. In the barrel wash area, water is reused in a closed system. Solids are removed from the liquid and recycled to the cookers. Washwater is dumped daily to the sewer. The water from the cooking vapor scrubbing operation is discharged to a hot well, and the liquid repumped to the scrubbers. The hot well overflow is discharged to the sewer. The non-condensable gases are burnt.

All wastewaters discharged to the sewer are collected in the first of two catch basins. In the first basin, the wastewater is heated, allowed to set, and fat skimmed off for reprocessing. Settleable materials are recycled to the steam jacketed cookers. The partially clarified wastewater is discharged to the second basin where the process is repeated. From this basin, the wastewater is discharged to the Ley Creek Sewerage System through a baffled skimming tank.

Sanitary sewage is segregated and discharged separately to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

Samples were collected from the effluent of the final sedimentation chamber during the period August 12 to August 16, 1968. Analyses were performed for BOD_5, BOD_{UC}, COD, pH, acidity or alkalinity, suspended solids, volatile suspended solids, grease, ammonia nitrogen, total organic nitrogen, orthophosphate, and total phosphate. The results of this survey are presented in Table COR-1. The rates of contaminant emission expressed in pounds per day are presented in Table COR-2.

The effluent flow rate is somewhat in doubt. During the survey period, the plant influent water meters were inoperative and poor mixing conditions would not permit flow estimation by the lithium dilution technique. Therefore, the flow during composite sampling was assumed to be 131,000 gallons per day; the average flow as presented in a previous wastewater questionnaire completed by Corenco and submitted to Onondaga County. Flow rates during grab sampling were estimated visually.

DISCUSSION

Data presented in Tables COR-1 and COR-2 indicate significant organic pollution in this wastewater. COD concentration varied from 475 to 2,440 mg/L, with an average effluent loading of 1,200 lbs/day. Carbon tetrachloride extractable materials expressed as grease varied widely, ranging in concentrations from 7.7 to 496 mg/L. Suspended solids average 330 mg/L but ranged as high as 974 mg/L. Volatile solids were generally 85 to 95 percent of the suspended solids.

The average organic load comprises approximately one percent of the COD load to the Ley Creek Sewage Treatment Plant and approximately two percent of the carbon tetrachloride extractable material loading.

A large amount of floating grease was observed on the surface of the final skimming tank indicating either relatively inefficient grease removal in the in-plant recovery facilities or infrequent skimming operations. (Note: Skimming is manual at this location.) It should be noted that the dry rendering process is generally considered to contribute less pollution than other rendering processes.

CONCLUSIONS

The BOD, grease, and suspended solids concentrations in the wastewater are generally in excess of those specified in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

1. Install flow measurement apparatus on the effluent from the baffled skimming tank.
2. Conduct a detailed in-plant survey to determine if the amount of grease currently being discharged can be reduced.
3. Install a more effective grease removal system on this effluent; i.e., air flotation and/or mechanical grease removal equipment.

CORENCO CORPORATION
EAST SYRACUSE, NEW YORK

TABLE COR-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

INDUSTRIAL WASTEWATER DISCHARGE

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	GREASE	NH3-N	TON	O-PO4	T-PO4
428	08 12 68	1430	grab	0.051	231	261	475	6.2	0	28	46	38	9.2	7.8	12.8	16.4	30.0
429	08 13 68	0838	18.1	0.131	426	546	708	6.7	0	3	186	160	71.4	36.4	15.7	12.0	24.0
433	08 13 68	1635	7.8	0.131	438	498	710	6.6	0	3	156	144	28.1	44.8	23.0	12.0	18.6
438	08 14 68	0845	16.0	0.131	624	828	1020	6.7	0	3	376	340	71.5	0.0*	0.0*	0.0*	0.0*
443	08 14 68	1245	3.0	0.131	1185	1740	2440	5.8	0	70	974	878	496.0	27.4	18.5	23.6	31.0
445	08 15 68	0830	18.2	0.131	555	699	830	5.6	0	70	312	286	7.7	30.8	14.8	14.6	18.0
450	08 15 68	1448	grab	0.393	381	522	705	5.7	0	60	148	114	200.0	48.7	39.8	12.8	17.0
454	08 16 68	0802	17.3	0.131	420	531	800	6.1	0	20	198	196	330.0	0.0*	0.0*	17.5	24.0
455	08 16 68	0810	grab	0.051	720	945	1580	5.8	0	20	298	288	197.0	38.6	9.3	35.0	48.5
458	08 16 68	1450	6.7	0.131	775	1010	1660	6.0	0	20	604	532	133.5	0.0*	0.0*	23.0	30.6

TABLE COR-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

INDUSTRIAL WASTEWATER DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	GREASE	NH3-N	TON	O-PO4	T-PO4
428	08 12 68	1430	0.051	98	111	202	6.2	0	12	20	16	3.9	3.3	5.4	6.9	12.7
429	08 13 68	0838	0.131	465	596	773	6.7	0	3	203	175	77.9	39.7	17.1	13.1	26.2
433	08 13 68	1635	0.131	478	543	775	6.6	0	3	170	157	30.6	48.8	25.1	13.1	20.3
438	08 14 68	0845	0.131	681	904	1113	6.7	0	3	410	371	78.0	0.0*	0.0*	0.0*	0.0*
443	08 14 68	1245	0.131	1293	1899	2663	5.8	0	76	1063	958	541.2	29.9	20.1	25.7	33.8
445	08 15 68	0830	0.131	606	763	906	5.6	0	76	340	312	8.5	33.6	16.1	15.9	19.6
450	08 15 68	1448	0.393	1247	1709	2308	5.7	0	196	485	373	654.7	159.4	130.3	41.9	55.6
454	08 16 68	0802	0.131	458	579	873	6.1	0	22	216	214	360.1	0.0*	0.0*	19.1	26.2
455	08 16 68	0810	0.051	306	401	671	5.8	0	8	127	122	83.7	16.4	3.9	14.8	20.6
458	08 16 68	1450	0.131	846	1102	1811	6.0	0	22	659	581	145.6	0.0*	0.0*	25.1	33.4

*=NO ANALYSIS

Crispy Maid Potato Chip Company
Midler Park
Syracuse, New York

MANUFACTURING PROCESSES

The Crispy Maid Potato Chip Company produces potato chips in a continuous process, using a long, narrow machine encompassing the following unit processes: peeling, slicing, washing, frying, baking, inspecting, cooling, and bagging. During the 5-day week, 6.5 hour production day, the firm processes roughly 80,000 pounds of potatoes. Crispy Maid has 11 employees.

WASTEWATER PRODUCTION AND TREATMENT

Process wastewater is generated at two major points during production, the peeling and slicing operations. In the peeling operation, potatoes enter an automatic peeler where skin and surface dirt are removed. The wastewater contains both starches and peelings. In the cutting operation, the potatoes are sliced into thin sheets and then washed. Starch is the major rinsewater contaminant. All process wastewaters, including equipment washwaters, run into an open channel alongside the machine. The flow from the channel discharges to the sewer, where process and sanitary wastewaters are combined and flow to the Ley Creek Sewage Treatment Plant.

The average water usage in the plant, based upon previous water bills, is 8,100 gallons per day. This includes an estimated 200 gallons per day for sanitary water usage and a process flow of 7,900 gallons per day.

SAMPLING AND ANALYSIS SURVEY

A grab sample was taken on each of three successive days from the potato peeler and the potato washer effluent streams while production was in progress. The samples were analyzed for BOD_5, BOD_{ult}, COD, suspended solids, volatile suspended solids, total solids, pH, and acidity or alkalinity. Flow rates were determined by "bucket and stopwatch" technique for the potato peeler flow and by the lithium dilution technique for the potato washer flow. The lithium dilution technique requires the addition of a lithium chloride solution at a known rate and concentration upstream of the sampling point. The flow rate is then calculated from the lithium concentration found in the sample.

Visually, it was ascertained that cooking oils were not dumped. If a spill did occur, it would be infrequently and of low volume (about 50-70 gallons maximum).

DISCUSSION

The results of the analyses of the samples from the potato peeler operation are shown in Table CM-1. The data expanded to pounds per day are shown in Table CM-2. Raw and expanded data from the potato washer wastewater are shown in Tables CM-3 and CM-4, respectively. As can be seen from the data, the BOD and suspended solids concentrations discharged from the potato peeling and washing operations exceed the allowable discharge limits set forth in Section 6(a) and 6(b) of "Rules and Regulations Governing the Use of Public Sewers."

A comparison of the total discharge from Crispy Maid with the contaminant loadings measured in the Ley Creek Sewage Treatment Plant influent is shown in Table 1. Since the Ley Creek Sewage Treatment Plant data is a measure of the daily loading (24-hour period), the Crispy Maid discharge should be compared on an equivalent basis. Therefore, with production on the potato peeler and potato washer approximately 2.5 and 6.5 hours per day, respectively, the survey data were adjusted to approximately 10 and 27 percent, of the values listed in Tables CM-2 and CM-4, respectively. The sum of the corrected values from the potato peeler and washer is used in the comparison in Table 1.

Based upon 6.5 hours production per day for the potato washer and 2.5 hours per day for the peeler, the process wastewater flow is calculated at 8,000 gallons per day. This is approximately the expected flow, based upon past records.

CONCLUSIONS

The suspended solids and BOD_5 concentrations in the samples collected exceed the standards established by the Onondaga County "Rules and Regulations Governing the Use of Public Sewers." However, the quantities are a relatively insignificant portion of the corresponding Ley Creek Sewage Treatment Plant influent loadings. These wastewaters are considered to be compatible with biological treatment at the Ley Creek Sewage Treatment Plant.

RECOMMENDATIONS

Continue to discharge the wastewater described above to the Ley Creek Sewage Treatment Plant.

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Crispy Maid Potato Chip Co.		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	.008	--	.033-.046
BOD_5	51,073	47,791	15,354-202,419	59	46	141-395
BOD_{uc}	71,117	69,572	19,912-251,149	93	71	269-756
COD	115,965	101,879	26,309-341,738	233	197	511-1664
pH	-	7.0	6.0-8.8	--	6.5	6.3-7.0
Acidity	838	0	0-6,647	--	--	--
Alkalinity	1,320	0	0-23,091	--	--	--
SS	74,776	54,205	1,599-325,906	156	151	677-1296
VSS	36,362	29,468	- -106,011	110	109	326-714
TS	-	-	-	--	--	--
Oil and Grease	10,326	8,634	2,602-22,496	--	--	--
Cyanide	8.71	1.99	0.09-95.98	--	--	--
Phenol	29.40	19.49	0.80-113.95	--	--	--
Chromium	39.91	30.37	10.19-198.87	--	--	--
Copper	34.65	32.48	9.09-76.22	--	--	--
Zinc	84.79	93.75	18.11-183.22	--	--	--
Cadmium	8.45	5.93	1.5-40.54	--	--	--
Nickel	16.22	15.59	2.05-38.19	--	--	--
NH_3	1,873.3	1,775.2	864.1-3,540.5	--	--	--
Org-N	3,278.2	3,111.4	979.6-6,822.2	--	--	--
Ortho-PO_4	3,244	2,957	727-15,294	--	--	--
Total-PO_4	6,397	6,762	1,200-19,542	--	--	--

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

CRISPY MAID POTATO CHIP COMPANY
SYRACUSE, NEW YORK

TABLE CM-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

POTATO PEELER

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	TS
062	06 26 68	1330	0.017	300	684	1200	6.3	0	26	3420	1252	0*
069	06 27 68	1345	0.018	330	1230	2030	6.5	0	18	4985	1337	5954
0	06 28 68	0840	0.017	300	336	1745	7.0	0	0	3768	1052	5502

TABLE CM-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

POTATO PEELER

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	TS
062	06 26 68	1330	0.017	44	100	176	6.3	0	4	500	183	0*
069	06 27 68	1345	0.018	51	189	312	6.5	0	3	765	205	914
075	06 28 68	0840	0.017	45	50	260	7.0	0	0	560	156	818

*=NO ANALYSIS

CRISPY MAID POTATO CHIP COMPANY
SYRACUSE, NEW YORK

TABLE CM-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

POTATO WASHER

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	TS
063	06 26 68	1330	0.016	690	1620	2390	6.5	0	20	1258	1214	0*
070	06 27 68	1345	0.028	1455	2400	5720	6.4	0	32	2248	2156	5554
074	06 28 68	0840	0.023	852	1140	3300	6.9	0	2	1826	1744	3756

TABLE CM-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

POTATO WASHER

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	TS
063	06 26 68	1330	0.016	97	227	335	6.5	0	3	177	170	0*
070	06 27 68	1345	0.028	344	567	1352	6.4	0	8	531	509	1312
074	06 28 68	0840	0.023	164	219	633	6.9	0	0	350	335	721

*=NO ANALYSIS

The Crouse Hinds Company
Wolf and Seventh North Streets
Syracuse, New York

MANUFACTURING PROCESSES

The Crouse Hinds Company manufactures electrical fittings, traffic signals, and illuminating fixtures. Basic processes include the molding of casting cores; metal melting (ferrous and non-ferrous); metal casting; casting, grinding, and cleaning; machining; heat treating; plating (zinc, copper, and cadmium); anodizing; painting; and assembling. Total employment is approximately 2,500, with 2,300 working during the first shift. The normal production schedule is 16 hours a day, 5 days a week.

WASTEWATER PRODUCTION AND TREATMENT

Process wastewaters include fines from the wet rotoclone, washwater from scrubbers over the casting shake-out trays, cutting and lubricating oils (almost all mineral hydrocarbon oils), plating rinsewaters, and product washing detergent solutions. Total water usage is approximately 750,000 gallons per day, with peak flows of approximately 1,500,000 gallons per day. Crouse Hinds estimates that 30 percent of the total water used is for cooling. The majority of the wastewater is produced during the first, or production, shift. The cooling and process wastewaters are discharged to the process sewer.

Water is softened for boiler and aluminum anodizing usage. The multi-grade coat filter, used in softening the water, is backwashed daily, with the backwash water discharged to the sewer. The volume of water softened per day was not determined.

The plating room is largely without abatement controls, but Crouse Hinds does recognize the need for in-plant control measures. Cyanide recovery is practiced. Currently more water is being used than required although some operations utilize countercurrent rinsing. Crouse Hinds anticipates the installation of additional countercurrent rinsing. Although no chrome plating is done in the area, some chromates are discharged to the sewer as a result of the bright dipping operations.

Table 1

The Crouse Hinds Company

Sampling Points and Wastewater Analyses

Sampling Points	Description	Types of Samples	Analyses
1	Total plant effluent at manhole immediately adjacent to the northwest wall of Building 21	Composite and Grab	BOD_5, BOD_{ult}, COD, SS, VSS, pH, alk/acid, oil and grease, cyanide, phenol, chromium, copper, zinc, cadmium, nickel, ortho-and total phosphate
2	Plant effluent at outfall to watercourse No. N.Y.P.-154-3A (at 7th North Street)	Grab	BOD_5, BOD_{ult}, COD, SS, VSS, pH, alk/acid, oil and grease, cyanide, phenol, chromium, copper, zinc, cadmium, nickel, ortho-and total phosphate
3	Manhole immediately adjacent to northeast wall of degritting building	Grab	oil and grease (CCl_4 Extractables)
4	Effluent from No. 16 Type N Rotoclone	Grab	pH, COD, SS, VSS, acid/alk.

The sanitary sewage is segregated from process wastewaters and discharged to the Ley Creek Sewage Treatment Plant System. The combined stormwater-process wastewater flow is discharged through a second sewer to a pond/stream (N.Y.S. P-154-3A). The pond, equipped with an experimental floating baffle and belt oil remover, has a very dark and turbid appearance although some of the fines do settle out. No consistent effort is made to remove oil retained by the baffle since this unit was only installed for experimental purposes.

Oil soaked metal turnings are stored outdoors prior to being shipped to reclaiming operations. Waste oil is drained to outdoor sumps and is collected by a scavenger. The turnings are sold to a secondary metals processor. Crouse Hinds is currently removing the ferrous foundry shakeout fines by polyelectrolyte-aided sedimentation. Currently, fines from the non-ferrous foundry are being discharged. Crouse Hinds estimates that these will be removed in 1969. Plans are being implemented to remove separable oil from the wastewater.

SAMPLING AND ANALYSIS SURVEY

GENERAL

A compilation of the wastewater flows sampled, the location of the sampling points, and the analyses performed are presented in Table 1. Photographs of the sampling locations and a map of the plant sewer systems are on file but have not been made a part of this report.

Some difficulty was encountered in obtaining representative samples for determination of oil content. The wastewater at both the outfall and the Building 21 manhole was relatively quiescent, thereby allowing a portion of the oil to separate and come to the surface. Consequently, oil determinations on samples taken from these sources could be highly variable and yield extremely high values if too great a proportion of the surface liquid were collected. Therefore, oil samples were obtained from a location (Sampling Point 3, above) where there was sufficient turbulence to allow representative oil determinations. Flow determinations described below showed that approximately 93 percent of the flow during the main working period (0700-1900) was included at this sampling location. Discussions with Crouse Hinds personnel indicated that the remaining flow was from an area with little if any oil wastage.

Estimations of total effluent flow were obtained by two independent means: 1) measurement of the influent flow from both plant water meters and 2) measurement of wastewater flow by the lithium dilution technique. By adding a premeasured lithium chloride solution at a known rate upstream of

the sampling point, the flow can be calculated based upon the lithium concentration found in the sample. Where composite samples are taken, the lithium dilution technique will yield the average flow rate over the compositing period. Influent flows were measured on an instantaneous basis as well as a cumulative basis. Wastewater flows were measured on a composite basis at Sampling Point 1 and on an instantaneous basis at Sampling Points 2, 3, and 4.

RESULTS

Data obtained during the sampling and analysis survey are presented in Tables CH-1, CH-3, CH-5, and CH-7 for Sampling Points 1 through 4, respectively. The rates of contaminant discharge expressed in pounds per day are presented in Tables CH-2, CH-4, CH-6, and CH-8 for Sampling Points 1 through 4, respectively.

Normal influent flow variability data collected by Crouse Hinds personnel indicated a nearly constant flow (approximately 0.15 mgd) from 0000-0600; a rapid rise to 1.2 mgd at 0700; a relatively constant flow (approximately 1.2 mgd) from 0700 to 1500 and a continuing decrease to 0.15 mgd from 1500 to 2400. A comparison of total influent flow meter readings with average effluent flows, as obtained by lithium dilution, indicate good correlation (Table 2). This correlation allowed the estimation of composite flows during those periods when lithium dilution was not used.

Instantaneous influent flows collected at the approximate time of wastewater sampling are shown in Table 3. Also included in Table 3 are instantaneous flows determined by lithium dilution at the oil sampling point (Sample Point 3) and at the plant outfall (Sample Point 2). Flows determined at the oil sampling point average approximately 93 percent of the water influent values. Flows determined at the plant outfall average approximately 20 percent higher than influent values.

DISCUSSION

The analytical data confirmed that wastewater characteristics of concern are pH, zinc, oil, cyanide, and suspended solids. On three separate composite samples of the plant effluent (Sample Point 1 - Building 21), pH was in the range of 2.0 to 2.5. Compositing times ranged from 5.7 hours to 17.5 hours ; therefore, a distinct possibility exists that short term pH values were significantly less than 2.0. Although the source of these acid discharges was not determined, Crouse Hinds personnel concluded that they were probably from the plating operation.

Table 2

The Crouse Hinds Company

Total Water Intake (mgd)

Date	Sample Time	Total Water Intake			Effluent Flow[1]
		Factory	Foundry	Total	
7/22-23	1645-1015	0.32	0.22	0.54	-
7/23	1130-1700	0.65	0.40	1.05	-
7/23-24	1715-0915	0.32	0.17	0.49	-
7/24	0857-1522	0.69	0.40	1.09	-
7/24-25	1525-0955	0.36	0.20	0.56	-
7/25	1000-1845	0.63	0.35	0.98	1.00
7/25-26	1850-0930	0.32	0.19	0.51	0.50
7/26	0935-1515	0.66	0.37	1.03	0.99

[1]by lithium dilution technique

Table 3

The Crouse Hinds Company

Instantaneous Flow Meter Readings (mgd)

Date	Time	Foundry Meter	Factory Meter	Total	Plant Outfall	Oil Sampling Plant
7/22	1120	0.520	0.710	1.230		
	1700	--	--			
7/23	1050	0.531	0.684	1.215		
	1655	0.266	0.558	0.824		
7/24	930	0.606	0.703	1.309		0.922
	1534	0.596	0.669	1.265	1.57	0.815
7/25	1005	0.545	0.696	1.241	1.35	0.966
	1900	0.188	0.469	0.657	0.86	0.780
7/26	1027	0.545	0.578	1.123	1.48	1.420
	1605	0.412	0.563	0.975	1.11	0.917

High zinc concentrations were noted in the total plant effluent at Building 21. These high concentrations could generally be correlated with the low pH samples described above. Concentrations of zinc as high as 80 mg/L were observed over a 14.7 hour compositing period, and it is estimated that approximately 200 pounds of zinc were released to the sewer over this period.

As shown by the data in Table CH-6, significant amounts of oil are being discharged to Ley Creek. Since the values shown are for grab samples, generally taken during the main working period, average daily values would probably be somewhat lower. Average oil losses during the main working periods averaged approximately 450 lbs/day.

Crouse Hinds has installed cyanide recovery equipment, and the data confirm that effluent cyanide values were generally below 1 mg/L with several exceptions. However, average concentrations as high as 2.7 mg/L were observed over an 18.5 hour composite period, and instantaneous values during this composite period are presumed to be higher.

Suspended solids concentrations varied from 106 mg/L to 274 mg/L. Since the polyelectrolyte-aided sedimentation process was still in its shakedown phase, it is not known whether these concentration values are representative. If effective, however, the effluent suspended solids concentration should be somewhat lower in the future.

Samples were collected from the Crouse Hinds outfall at 7th North Street to determine if significant pollution was entering from sources other than Crouse Hinds. Observed flow values were approximately 20 percent higher than at the plant influent. A rigorous statistical analysis was not attempted since the sampling bases for the two sampling points were not the same; i.e., composite verses grab. However, data in Tables CH-2 and CH-4, (Sampling Points 1 and 2) indicate that no substantial additional source of pollution is present at the outfall. It is assumed that the 20 percent additional flow is the dry weather flow from the municipal storm sewer.

CONCLUSIONS

Based upon the on-site interviews and the sampling and analysis survey, the following conclusions were drawn:

1. The Crouse Hinds effluent as presently constituted would not be acceptable for discharge into the Ley Creek System.
2. Unacceptable levels of zinc, acidity, and oil are present in the wastewater over relatively long periods of time.
3. Cyanide levels are rather high over relatively long time periods. While these may generally be acceptable for discharge, they indicate some control problems in the cyanide recovery system.

4. With continued attention, the solids removal system should be adequate to maintain suspended solids concentrations at acceptable levels.
5. Observations made during the in-plant visit indicate that there is significant potential for water use reduction and clean water segregation. Clean waters can be segregated, once-through cooling waters recirculated, plating rinse baths made countercurrent, plating room water use improved, cutting oils separated, and rotoclone fines removed. Adequate delineation of potential systems would take detailed study.

RECOMMENDATIONS

Based on the above conclusions, the following recommendations are made:

1. Find and remove the source of the occasional high discharges of zinc and acid.
2. Provide oil removal and/or recovery facilities.
3. Provide effluent flow monitoring and sampling facilities.
4. Institute a comprehensive, continuing waste monitoring program so that occurrences such as high cyanides, zinc, and oil values could be quickly detected and corrected.
5. Continue the water conservation program.

THE CROUSE HINDS COMPANY
SYRACUSE, NEW YORK

TABLE CH-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

PLANT EFFLUENT AT BLD 21

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	BOD5	BODULT	COD	PH	ALKAL	ACID	OIL	SS	VSS	CN	PHENOL	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
179	07 22 68	1655	1.0	0.000*	30	126	254	7.0	0	0	0.0*	274	90	0.970	0.000*	0.73	0.37	0.90	0.33	<0.03	11.2	17.0
188	07 23 68	1015	17.5	0.540[1]	68	113	189	2.5	0	314	0.0*	134	50	0.008	0.000*	1.04	0.40	80.00	4.20	0.06	0.4	6.0
193	07 23 68	1700	5.5	1.050[1]	15	135	245	7.0	0	0	0.0*	168	52	0.120	0.000*	2.24	0.35	1.16	0.41	<0.03	17.3	23.5
213	07 24 68	0915	16.0	0.490[1]	24	39	121	6.6	0	12	0.0*	114	24	0.670	0.000*	0.68	0.21	12.00	0.17	<0.03	5.0	7.5
221	07 24 68	1522	5.5	1.090[1]	3	15	224	6.8	0	6	0.0*	204	60	0.570	0.000*	0.42	0.42	12.20	0.28	<0.03	14.3	21.5
248	07 25 68	0955	18.5	0.560[1]	12	18	290	6.9	0	3	0.0*	236	98	2.670	0.056	0.91	0.41	17.00	0.58	<0.03	15.5	27.0
269	07 25 68	1845	8.8	1.000	3	9	260	5.0	0	70	0.0*	278	100	2.160	0.100	0.85	0.33	21.00	0.57	<0.03	40.0	105.5
291	07 26 68	0930	14.7	0.500	5	6	150	2.0	0	263	0.0*	106	52	1.250	0.210	0.82	0.30	58.00	0.33	<0.03	123.0	173.0
308	07 26 68	1515	5.7	0.990	3	6	224	2.0	0	160	0.0*	136	70	0.150	0.200	0.66	0.37	41.00	0.54	<0.03	80.0	87.5
309	07 26 68	1525	grab	0.900	18	30	505	5.4	0	30	176.0	220	128	0.410	0.580	0.52	0.59	11.42	0.54	<0.03	28.5	39.0

TABLE CH-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

PLANT EFFLUENT AT BLD 21

ID	DATE	TIME	FLOW	BOD5	BODULT	COD	PH	ALKAL	ACID	OIL	SS	VSS	CN	PHENOL	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
179	07 22 68	1655	0.000*	0*	0*	0*	7.0	0*	0*	0.0*	0*	0*	0.000*	0.000*	0.00*	0.00*	0.00*	0.00*	0.00	0.0*	0.0*
188	07 23 68	1015	0.540[1]	306	508	850	2.5	0	1412	0.0*	603	225	0.036	0.000*	4.67	1.80	359.65	18.89	0.27	1.8	26.*
193	07 23 68	1700	1.050[1]	131	1181	2143	7.0	0	0	0.0*	1469	455	1.049	0.000*	19.59	3.06	10.14	3.56	<0.26	151.3	205.5
213	07 24 68	0915	0.490[1]	98	159	494	6.6	0	49	0.0*	465	98	2.734	0.000*	2.77	0.35	48.98	0.69	<0.12	20.4	30.6
221	07 24 68	1522	1.090[1]	27	136	2034	6.8	0	54	0.0*	1852	545	5.175	0.000*	3.81	3.81	110.77	3.54	<0.37	129.8	195.2
248	07 25 68	0955	0.560[1]	56	84	1353	6.9	0	14	0.0*	1101	457	12.455	0.261	4.24	1.91	79.30	2.70	<0.14	72.3	125.9
269	07 25 68	1845	1.000	25	75	2166	5.0	0	583	0.0*	2316	833	17.992	0.833	7.08	2.74	174.93	4.74	<0.25	333.2	878.9
291	07 26 68	0930	0.500	21	25	625	2.0	0	1095	0.0*	441	217	5.206	0.874	3.41	1.25	241.57	1.37	<0.12	512.3	720.5
308	07 26 68	1515	0.990	25	49	1847	2.0	0	1319	0.0*	1122	577	1.237	1.649	5.44	3.05	339.11	4.45	<0.24	669.7	721.5
309	07 26 68	1525	0.900	135	225	3786	5.4	0	225	1319.4	1649	960	3.073	4.348	3.89	4.42	85.61	4.04	<0.22	212.6	242.3

*=NO ANALYSIS
[1]EFFLUENT FLOW ASSUMED EQUAL TO INFLUENT FLOW

THE CROUSE HINDS COMPANY
SYRACUSE, NEW YORK

TABLE CH-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

EFFLUENT AT 7TH N- PIPE

ID	DATE	TIME	FLOW	BOD5	BODULT	COD	PH	ALKAL	ACID	OIL	SS	VSS	CN	PHENOL	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
177	07 22 68	1105	0.000*	24	84	123	7.0	0	0	80.0	100	40	0.000*	0.00*	0.61	0.18	0.76	0.32	<0.03	7.6	10.0
183	07 22 68	1640	0.000*	21	39	189	6.0	0	20	82.5	130	58	0.450	0.00*	0.25	0.22	8.00	0.28	<0.03	4.4	8.0
186	07 23 68	1140	0.000*	60	105	198	6.9	0	0	105.0	112	40	0.100	0.00*	0.32	0.13	8.50	0.20	<0.03	8.4	25.0
225	07 24 68	1620	1.570	57	183	4250	6.4	0	10	850.0	1668	1492	0.022	0.00*	0.33	0.19	6.00	0.15	<0.03	11.0	16.5
249	07 25 68	1120	1.350	18	30	187	6.3	0	10	74.8	184	100	3.000	0.05	0.62	0.50	11.40	0.60	0.03	11.5	25.0
273	07 25 68	1930	0.860	15	22	667	4.8	0	116	292.5	218	156	0.660	0.06	0.38	0.22	13.50	0.46	0.03	40.0	220.0
296	07 26 68	1105	1.480	30	39	533	0.0*	0*	0*	61.5	212	94	0.460	0.28	0.29	0.16	10.10	0.22	<0.03	40.0	72.5
312	07 26 68	1549	1.110	33	42	393	5.7	0	20	80.0	174	78	0.290	0.17	0.32	0.47	11.00	0.42	<0.03	17.0	25.0

TABLE CH-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

EFFLUENT AT 7TH N- PIPE

ID	DATE	TIME	FLOW	BOD5	BODULT	COD	PH	ALKAL	ACID	OIL	SS	VSS	CN	PHENOL	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
177	07 22 68	1105	0.000*	0*	0*	0*	7.0	0*	0*	0.0*	0*	0*	0.000*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*
183	07 22 68	1640	0.000*	0*	0*	0*	6.0	0*	0*	0.0*	0*	0*	0.000*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*
186	07 23 68	1140	0.000*	0*	0*	0*	6.9	0*	0*	0.0*	0*	0*	0.000*	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*
225	07 24 68	1620	1.570	745	2393	55582	6.4	0	131	11116.3	21814	19513	0.287	0.00*	4.31	2.48	78.46	1.96	0.39	143.3	215.7
249	07 25 68	1120	1.350	202	337	2103	6.3	0	112	841.1	2069	1125	33.736	0.56	6.97	5.62	128.19	6.74	0.33	129.3	281.1
273	07 25 68	1930	0.860	107	158	4778	4.8	0	831	2095.4	1562	1118	4.728	0.43	2.72	1.57	96.71	3.29	0.21	286.6	1576.0
296	07 26 68	1105	1.480	370	481	6571	0.0*	0*	0*	758.2	2614	1159	5.671	3.45	3.57	1.97	124.51	2.71	0.37	493.1	893.8
312	07 26 68	1549	1.110	305	388	3634	5.7	0	185	739.7	1609	721	2.681	1.57	2.95	4.34	101.71	3.88	0.27	157.1	231.1

*=NO ANALYSIS

THE CROUSE HINDS COMPANY
SYRACUSE, NEW YORK

TABLE CH-5

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

OILY SEWER

ID	DATE	TIME	FLOW	OIL
176	07 22 68	1055	0.794	97.5
180	07 22 68	1655	0.735	55.0
219	07 24 68	0920	0.922	236.5
224	07 24 68	1548	0.815	155.0
270	07 25 68	1913	0.780	158.0
292	07 26 68	0940	1.420	84.0
310	07 26 68	1507	0.917	39.2

TABLE CH-6

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

OILY SEWER

ID	DATE	TIME	FLOW	OIL
176	07 22 68	1055	0.794	644.8
180	07 22 68	1655	0.735	336.7
219	07 24 68	0920	0.922	1816.3
224	07 24 68	1548	0.815	1052.2
270	07 25 68	1913	0.780	1026.5
292	07 26 68	0940	1.420	993.6
310	07 26 68	1507	0.917	299.4

*=NO ANALYSIS

THE CROUSE HINDS COMPANY
SYRACUSE, NEW YORK

TABLE CH-7

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

NO. 16 ROTOCLONE

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	VSS
260	07 25 68	1015	0.007	65	7.5	9	0	122	20
294	07 26 68	1035	0.007	9	5.4	0	40	56	32

TABLE CH-8

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

NO. 16 ROTOCLONE

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	VSS
260	07 25 68	1015	0.007	4	7.5	1	0	7	1
294	07 26 68	1035	0.007	1	5.4	0	2	3	2

*=NO ANALYSIS

Curry McLaughlin and Len, Inc.
Pickard Building
East Molloy Road
Syracuse, New York

MANUFACTURING PROCESSES

Curry, McLaughlin and Len manufactures electronic microwave instruments. Currently, 25 persons are employed on an 8-hour per day, 5-day per week basis. The company expected to move to expanded facilities in August 1968.

WASTEWATER PRODUCTION AND TREATMENT

Industrial wastewaters consist of copper etching solutions, alkaline cleaners, deoxidizers, coloring solutions (Iridite), and photographic wastes. These are presently batch dumped, 15-20 gallons per dump, to the ground surface. Total volume is probably less than 500 gallons per year. It was anticipated that the new facilities would be served by a sewerage system.

An estimated 250 gallons of sanitary wastewater were discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

The wastewaters are not suitable for surface disposal.

RECOMMENDATIONS

Wastewaters should be handled by a scavenger or be pretreated for disposal to a sewerage system.

Custom Sheet Metal Corporation
1942 Teall Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Custom Sheet Metal Corporation fabricates sheet steel into desired shapes by bending, drilling, punching, welding or similar operations. Five persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The wastewater is generally limited to sanitary sources. Manufacturing processes are completely dry. A possible additional wastewater source is cooling water from the welding operation. The water in this system is recirculated, however, and losses should be minimal.

Total water usage is estimated at 50 gallons/day. The sanitary wastewater is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge the wastewater described above to the Ley Creek Sewerage System.

Paul de Lima Company, Inc.
5918 East Molloy Road
East Syracuse, New York

MANUFACTURING PROCESSES

The Paul de Lima Company, Inc. roasts and packages coffee beans. Fourteen persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The two major sources of wastewater are cooling water from a water cooled vacuum pump and sanitary facilities. Total water use is approximately 1,000 gallons/day. It is estimated that 150 gallons/day are used for sanitary purposes and 800 gallons/day for pump cooling. The remaining 50 gallons/day are used in the roasting operation and are lost to the atmosphere.

All wastewater is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

1. Continue to discharge the sanitary wastewater described above to the Ley Creek Sewerage System.
2. Discharge pump cooling water, if uncontaminated, to the storm water system.

Eagle Metalcraft, Inc.
3550 Burnet Avenue
East Syracuse, New York

MANUFACTURING PROCESSES

Eagle Metalcraft, a specialty "job shop," manufactures aluminum products and also does a small amount of steel work. Production processes include machining, fabricating, cleaning, etching, and finishing aluminum. Currently, 19 persons are employed on an 9-hour day, 5-day week basis.

WASTEWATER PRODUCTION AND TREATMENT

The machining and fabrication of aluminum is a "dry" operation and, as such, does not contribute process wastewater. The principal source of wastewater is the etching room, where rinsewater overflow from the phosphoric acid etch tank and the cleaner (soap) tank is discharged through a floor drain. Both chromates and phosphates are present in the rinsewater.

Total plant water usage of 10,500 gallons per day (average) is metered according to ultimate use: 1) a metered line for sanitary purposes and cooling water for several welders and spot welders and 2) an influent metered line for the etch room water requirements. Approximately 1,000 gallons a day are used for sanitary and cooling water needs and are segregated from process wastewaters. Recirculation of the cooling water is not feasible. In the etch room, where the metals are cleaned in a hot alkaline cleaner (Oakite 30) and etched with various salts and/or a weak solution of phosphoric acid, average water usage is approximately 18,000 gallons per day. The etch room generally operates 2-3 days per week resulting in an average daily flow over the 5-day week of approximately 9,000 gallons/day. Because tanks are never dumped, the only process wastewater is the rinsewater overflow discharging to the floor drain. Water management is quite good and the water is shut off whenever the rinse tanks are not being used.

SAMPLING AND ANALYSIS SURVEY

The wastewater sampling survey was conducted by ROY F. WESTON personnel between 13 and 16 August, 1968. Both grab and composite samples

of the etch room wastewater were obtained and analyzed for chemical oxygen demand (COD), suspended solids (SS), volatile suspended solids (VSS), pH, acidity/alkalinity, total chrome, orthophosphate, and total phosphates. Effluent flow rates were determined by reading the etch room influent water meter at the start and end of the sampling period.

DISCUSSION

Analytical data are given in Table EM-1, and the data extended to pounds per day are shown in Table EM-2. When evaluating the data in Table EM-2, it is important to understand that the flow rates and total loadings are either instantaneous (grab samples) or average (composite samples) rates. As such, they are not representative of the total discharge per day but, rather, the rate of discharge over the sampling period. Because Eagle Metalcraft operates on approximately an 8-hour day basis, the total flow and contaminant emissions are approximately one-third of the values shown in Table EM-2. The data in Table 1 has been adjusted accordingly to make a comparison between the influent loadings to the Ley Creek Sewage Treatment Plant and contaminant loadings in Eagle Metalcraft's effluent. The etch room effluent average flow of 18,000 gallons per day contributes relatively negligible amounts of oxygen demand materials, suspended solids, and total chromium. The pH was generally in the range of 6.3 to 8.5 while the total phosphate concentration ranged from 40 mg/L to 1,800 mg/L, with an average concentration of 416 mg/L.

CONCLUSIONS

The plant effluent is relatively clean except for phosphate concentrations, which are high but are not a significant percentage of the total phosphate present in the influent to the Ley Creek Sewage Treatment Plant. (To date, no discharge limitations have been established for phosphates by Onondaga County.)

RECOMMENDATIONS

Continue processing operations to assure a wastewater quality equal to that measured during the wastewater survey.

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Eagle Metalcraft Effluent		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	0.018	0.019	0.027-0.066
BOD_5	51,073	47,791	15,354-202,419	--	--	--
BOD_{uc}	71,117	69,572	19,912-251,149	--	--	--
COD	115,965	101,879	26,309-341,738	11	3	4-97
pH	-	7.0	6.0-8.8	--	6.8	6.3-8.5
Acidity	838	0	0-6,647	2	2	0-16
Alkalinity	1,320	0	0-23,091	5	--	0-104
SS	74,776	54,205	1,599-325,906	33	4	8-503
VSS	36,362	29,468	- -106,011	--	--	--
TS	-	-	-	--	--	--
Oil and Grease	10,326	8,634	2,602-22,496	--	--	--
Cyanide	8.71	1.99	0.09-95.98	--	--	--
Phenol	29.40	19.49	0.80-113.95	--	--	--
Chromium	39.91	30.37	10.19-198.87	0.03	0.02	0.04-0.17
Copper	34.65	32.48	9.09-76.22	--	--	--
Zinc	84.79	93.75	18.11-183.22	--	--	--
Cadmium	8.45	5.93	1.5-40.54	--	--	--
Nickel	16.22	15.59	2.05-38.19	--	--	--
NH_3	1,873.3	1,775.2	864.1-3,540.5	--	--	--
Org-N	3,278.2	3,111.4	979.6-6,822.2	--	--	--
Ortho-PO_4	3,244	2,957	727-15,294	38.9	18	17.5-546.9
Total-PO_4	6,397	6,762	1,200-19,542	63	18	19.2-863.6

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

Fairbanks Dairies
1817 Erie Boulevard East
Syracuse, New York

MANUFACTURING PROCESSES

Fairbanks Dairies is a milk distributing plant. There is no milk processing or bottling on the premises. Currently, 13 persons are employed.

WASTEWATER PRODUCTION AND TREATMENT

The sources of wastewater are sanitary facilities and cooling and washing operations. Water use averages 4,200 gallons/day. Sanitary usage is estimated at 130 gallons/day.

All wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected at this location.

CONCLUSIONS

There are no significant industrial wastewater problems at this location. The major water use is for cooling.

RECOMMENDATIONS

1. Continue to discharge the wastewater described above to the Ley Creek Sewerage System.
2. Evaluate the apparent high use of cooling water and, if practical and economical, reduce the volume discharged.
3. Discharge clean cooling waters to the storm sewer system.

Falso Industries, Inc.
New Court Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Falso Industries, Inc. is a "job shop" metal fabricating plant with twenty-five persons employed on an 8-hour per day, 5-day per week basis. Unit processes include welding, degreasing and painting.

WASTEWATER PRODUCTION AND TREATMENT

Both sanitary and cooling wastewaters are discharged. The sanitary usage is estimated at 250 gallons/day. Cooling water used in three heliarc welders, two spot welders, and one vapor degreaser is estimated at 1,950 gallons/day. Total water usage is approximately 2,200 gallons/day. Water used in the spray paint booth is reused continuously.

All wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no industrial waste problem.

RECOMMENDATIONS

1. Continue to discharge the sanitary wastewaters described above to the Ley Creek Sewerage System.
2. Discharge clean cooling waters to the storm water system.

Franklin Engine Company
Liverpool Road
Syracuse, New York

MANUFACTURING PROCESSES

The Franklin Engine Company manufactures engines for light aircraft and helicopters. Production operations begin with the preparation of the metals from which the engine parts are made. After the parts have been made and assembled, the engines are tested. In the largest production area of the plant, engine blocks and related parts are drilled, tapped, and machined.

At the time of the survey, Franklin Engine employed approximately 155 persons, with 150 working on the first shift and the balance on the second and third shifts. The normal work schedule is 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

Based upon previous water bills, Franklin Engine Company uses approximately 70,000 gallons of water per day. Although information is not available on where the water is being used, Franklin Engine personnel estimated that the majority is used as cooling water and the remainder used for rinsing and sanitary purposes.

The principal wastewater producing area is the plating room operation, where a small quantity of selected parts are plated on an unpredictable schedule. After plating, the parts are rinsed, and the rinsewater containing alkalis or acids, phosphates, and small amounts of metals are discharged to the process/cooling water collection system. Small quantities of wastewater generated in other areas of the plant are:

1. Rinsewater used to remove penetrating phosphorus compounds in the stress crack testing area.
2. Blowdown from boilers and compressors and oily spills in the basement area.
3. Rinsewater from the solvent cleaning area.

The cooling and process wastewaters are discharged to Bloody Brook, which flows directly through company property. Sanitary sewage, estimated at 1,500 gallons per day, is discharged via a separate sewer to the Ley Creek Treatment Plant System.

SAMPLING AND ANALYSIS SURVEY

Grab samples were obtained from the plating room discharge, while the plating operation was in progress. Concurrently, flow rates were measured by the "bucket and stopwatch" technique. Samples were analyzed for chemical oxygen demand (COD), suspended solids (SS), pH, alkalinity or acidity, cyanides, total chromium, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate.

Composite samples were collected from Bloody Brook downstream of the plant. No flow determinations were attempted. Based on inspection of the stream, flow was minimal upstream of the plant during a period of no rainfall, but increased significantly downstream of the plant. Effluent flow, calculated from water use records, should average approximately 140 gallons per minute over the 8-hour production shift. The samples were analyzed for the same pollutants as the grab samples as well as for total oil and grease.

DISCUSSION

Analytical data, raw and extended to pounds per day, for the grab and composite samples are given in Tables FE-1 and FE-2, respectively. Samples of the plating room discharge had low contaminant levels, but one fairly high pH value was measured. The pH of the Bloody Brook composite sample, collected at about the same time, was equally high. Except for oil, contaminant levels in the stream samples were low. Traces of oil were observed downstream of the plant on several occasions, but never upstream.

CONCLUSIONS

1. Minor concentrations of metals and other contaminants were measured in the plating room discharge and in the stream; however, the potential exists for these levels to be significantly greater.
2. Oily wastewaters are discharged to Bloody Brook.
3. Cooling waters comprise the majority of the effluent flow from the plant.

RECOMMENDATIONS

1. Stop discharging oily wastewaters to Bloody Brook.
2. Reduce plating rinsewaters to a minimum and discharge to the sanitary sewer. Contaminant concentrations after flow reduction must be consistent with the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."
3. Continue to discharge clean, uncontaminated cooling water to Bloody Brook.

FRANKLIN ENGINE COMPANY
SYRACUSE, NEW YORK

TABLE FE-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

PLATING ROOM DISCHARGE

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
392	08 06 68	1000	0.009	20	7.0	0	0	0	0.0013	<0.01	0.04	0.03	0.02	<0.03	0.05	0.37
399	08 06 68	1615	0.000*	<10	7.0	0	0	2	0.0038	0.18	0.03	0.03	0.03	0.06	<0.05	0.35
406	08 07 68	1545	0.000*	10	7.0	0	0	6	<0.0010	0.08	0.04	0.02	0.05	<0.03	<0.05	0.30
408	08 07 68	1338	0.017	20	6.8	0	5	0	0.0062	0.08	0.04	0.02	0.07	<0.03	<0.05	0.52
411	08 08 68	1013	0.017	50	6.5	0	4	6	0.0092	0.05	0.04	0.03	0.03	<0.03	<0.05	0.42
413	08 08 68	1543	0.019	<10	6.4	0	4	0	0.0057	0.03	0.07	0.03	<0.02	0.04	<0.05	0.03
422	08 09 68	1503	0.018	88	9.4	170	0	6	0.0036	0.34	0.00*	0.05	<0.02	<0.03	0.90	5.70

TABLE FE-2

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

BLOODY BRK DWN.STR.-FRK ENG CO

ID	DATE	TIME	SAMPLING TIME HOURS	COD	PH	ALKAL	ACID	SS	OIL	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
393	08 06 68	1030	grab	70	6.6	0	5	24	0.0*	0.0023	0.01	0.045	0.11	<0.02	<0.03	0.5	1.3
398	08 06 68	1600	5.7	68	6.0	0	6	28	0.0*	0.0062	0.00*	0.000*	0.00*	0.00*	0.00*	1.2	1.8
404	08 07 68	1550	7.3	100	6.5	0	5	36	0.0*	0.0023	0.01	0.050	0.08	<0.02	<0.03	0.4	1.3
407	08 07 68	1355	grab	130	6.2	0	4	24	0.0*	0.0020	0.09	0.045	0.09	0.00*	<0.03	0.3	0.7
412	08 08 68	1550	7.4	30	6.6	0	5	12	0.0*	<0.0020	0.02	0.020	0.04	<0.02	0.06	0.8	2.0
421	08 09 68	1515	6.9	88	9.4	180	0	64	16.6	0.0027	0.03	0.000*	0.07	<0.02	<0.03	17.7	23.0
424	08 09 68	1513	grab	30	0.0*	0*	0*	24	4.7	0.0000*	0.07	0.000*	0.06	<0.02	<0.03	0.0*	0.0*

*=NO ANALYSIS

Frey's Pattern Shop
305 Factory Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Frey's Pattern Shop fabricates patterns and small castings on a "job shop" basis. There are three persons employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The only source of wastewater is from sanitary usage. Total water use at this establishment is 65 gallons/day. It is estimated that this entire volume is discharged to a septic tank on the premises.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no wastewater problem.

RECOMMENDATIONS

Continue to discharge the sanitary wastewaters to the septic tank as long as this procedure is adequate and appropriate.

J. F. Friedel Paper Box Company
302 West Second Street
East Syracuse, New York

MANUFACTURING PROCESSES

The J. F. Friedel Paper Box Company manufactures paper boxes from raw paper stock. Currently, fifty-five persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The manufacturing processes do not use a significant amount of water. It is estimated that 30 gallons/day are used in incidental cleaning operations (glue tray cleaning).

The total plant water usage is approximately 930 gallons/day, with sanitary usage estimated at 900 gallons/day.

All wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no significant industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge the wastewaters described above to the Ley Creek Sewerage System.

Gaebel Enterprises, Inc.
100 Ball Street
East Syracuse, New York

MANUFACTURING PROCESSES

Gaebel Enterprises, Inc., manufactures metal rules and scales. Currently there are eight persons employed on an 8-hour per day, 5-day per week basis.

The manufacturing process entails marking by a photo-plastic process with subsequent etching using sulfuric acid.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is derived from sanitary sources and from the rinsing of the acid-etched metal.

Total water usage is estimated at 200 gallons/day. An estimated 160 gallons/day results from sanitary sources.

All wastewater is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no significant industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge the wastewaters described above to the Ley Creek Sewerage System.

Gardall Corporation
4077 New Court Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Gardall Corporation manufactures safes. Currently, 14 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is used for sanitary purposes and for cooling welding equipment. Total water use is estimated at 1,250 gallons/day with 1,000 gallons/day attributable to the cooling operation. The cooling water is currently being discharged to the plant grounds but will be connected to the sewerage system in the near future. Sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no industrial wastewater problem.

RECOMMENDATIONS

1. Continue to discharge the wastewater described above to the Ley Creek Sewerage System.
2. Discharge clean cooling water to the stormwater system.

General Electric Company
Court Street Road
Syracuse, New York

MANUFACTURING PROCESSES

The General Electric Court Street Road complex houses the Heavy Military Electronics Division. Missile and space detection equipment, submarine and shipborne sonar equipment, radio guidance systems, and other heavy military electronic equipment are designed and manufactured at this location. Total employment is approximately 2,500 with 2,000 on the first shift and 500 on the second shift. The normal work week is 5 days. The 12 separate buildings comprising the Court Street Complex are designated 1 through 9 and A through C. The operations conducted in each building are listed below:

Building Number	Operation
1	Offices for engineering, accounting, and computer personnel
2	Machine Shop and plating room
3	Electronic testing, laboratories, and offices
4	Offices and reproduction facilities
5A	Warehouse
5	Offices, computer facilities, model shop, and the aluminum brazing and finishing areas
6	Engineering offices and the electronic testing laboratory
7	Offices, electronics assembly operation and a computer section
8	Being converted into a testing area

Building Number	Operation
9	Small test labs and offices for engineering personnel
A	Storage area
B	Ceramic printing manufacturing
C	Storage area

WASTEWATER PRODUCTION AND TREATMENT

On 18 April 1968 members of the firm of ROY F. WESTON visited the facilities to obtain general information regarding industrial wastewater discharges. Based upon information obtained during this initial visit, significant wastewater discharges apparently emanate from the plating room operation in Building 2, the aluminum brazing and aluminum finishing areas in Building 5, and from the ceramic printing manufacturing operation and the preparation area in Building B. Sanitary wastewater discharges were not considered during this survey. A copy of General Electric's Drawing No. PL-612 showing the location of the facilities is on file but is not appended to this report.

Wastewater from the plating operation, consisting mainly of rinse tank overflows, is discharged to the sanitary sewer through a collection sump located outside of Building 2. Contaminants present in this wastewater consist of the general plating chemicals and cleaners used in the plating operation. Water use records for Building 2 obtained from General Electric's Utilities Department records indicated approximately 7 million gallons per month of water were used during 1966. About 300 people are employed in this building.

Wastewater producing operations in Building 5 are associated with the aluminum brazing and aluminum finishing departments. The aluminum brazing operation consists of placing aluminum parts in a molten salt mixture of sodium fluoride, lithium chloride, and Park Chemical Company's Aluminum Brazing Salt E. After treatment, the parts are transferred to two, continuously-running, hot-water rinse tanks in series. Salt contaminants are present in the rinse tank overflows. Flow through the two rinse tanks is maintained at a rate of approximately 4 gpm each by means of restrictive orifices. In addition, condensate return (approximately 1 gpm) from live steam injection heating is discharged, thus yielding an estimated total wastewater flow of 9 gpm. This wastewater is discharged to the sanitary/process sewer. Currently, this operation is in production for only one shift at a reduced rate.

The aluminum finishing operation located in Building 5 was observed to be a source of wastewater. Rinsewater and an occasional concentrated dump of aluminum finishing chemical are discharged to a common floor trench before entering a sump located outside of Building 5. Stormwater from the building's roof drains is discharged to this sump. Wastewater from the sump is discharged into Saunders Creek, a tributary of Ley Creek. At the time of our initial visit, GE personnel stated that a contract had been awarded to construct a bypass sewer so that the contaminated portion of the wastewater would discharge directly to the sanitary/process sewer. Subsequent communication with GE personnel revealed these modifications were completed in August 1968.

In the ceramic printing area of Building B, ceramic pieces are cleaned in an Oakite 202 solution and then rinsed in three five-gallon rinse tanks. The rinsewater is dumped once each day. In the preparation area wastewater results from washing the spray dryer, ball mill, and floor. The ceramics prepared here are composed principally of barium titanate, cobalt carbonate, and a fuchsia dye. Wastewaters from weekly floor cleaning and monthly washings of the dryer and ball mill are discharged to a small settling sump, where most of the suspended matter is removed. The settled effluent is discharged to a sewer draining to a tributary of Ley Creek. Although both of the wastewater sources appeared to be minimal and did not require sampling, they are potential sources of contamination and should be piped to the sanitary/process sewer.

SAMPLING AND ANALYSIS SURVEY

During the period from June 25 through July 1, samples were collected from wastewaters originating in Buildings 2 and 5. The plating room wastewater discharge was sampled from the sump located outside of Building 2. Composite samples were taken with a proportioning pump for both the first and second shifts. Grab samples were collected when flow measurements were being made by the lithium dilution technique. A standard lithium chloride solution was added at a known rate to the rinsewater discharge in the plating room. The lithium concentration found in the grab sample allowed the flow rate to be calculated. Flow rates determined in this manner were approximately 150 gpm and were assumed to be fairly constant throughout the operating day. The measured flow rate was approximately 50 percent of the 1966 water consumption for Building 2 after subtracting usage for sanitary purposes. Although some doubt exists as to the actual flow, the flow as measured by the lithium dilution method was used in all calculations of total effluent contaminant loading. Results of the analysis on the seven composite samples from Building 2 are shown in Table GECS-1. Data extended to pounds per day are shown in Table GECS-2. The samples were analyzed for COD, suspended solids, total solids, pH, alkalinity or acidity, cyanides, total chrome, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate.

Wastewater from the aluminum brazing area in Building 5 was sampled with a proportioning pump placed in a sump located under the two rinse tanks. Five composite samples taken during the first shift were analyzed for COD, suspended solids, total solids, pH, alkalinity or acidity, chlorides, and lithium. A spot check was made of total chrome, copper, zinc, cadmium, and nickel content. Results of these analyses are shown in Table GECS-3, and the data extended to pounds per day are shown in Table GECS-4. The lithium dilution technique for measuring flow could not be used at this location since lithium is used in the manufacturing process. As described earlier, the estimated flow at this point is 9 gallons per minute.

Composite samples of the wastewater from the aluminum finishing area were taken from a collection sump located outside of Building 5. Flow determinations were made by lithium dilution technique. The process flows measured generally varied from 32 to 46 gpm. However, a flow of 240 gpm was measured during a rainfall.

The composite and grab samples were analyzed for COD, suspended solids, pH, alkalinity or acidity, cyanides, total chrome, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate. The results of these analyses are shown in Table GECS-5, while the data extended to pounds/day are shown in Table GECS-6.

DISCUSSION

Analysis of the wastewater samples collected from the aluminum brazing and aluminum finishing area in Building 5 indicated no significant concentrations of contaminants. However, these wastewaters should be (and now are) discharged to the process/sanitary sewer. Contaminants present in the samples collected appear to be compatible with biological treatment.

Analysis of the wastewater samples collected from the plating room in Building 2 show significant contamination, especially with regard to cyanides. The total pounds of contaminants discharged from Building 2 are compared to the contaminant loadings measured in the Ley Creek Sewage Treatment Plant influent in Table 1. Since the loading on the Ley Creek plant is on a daily basis and GE operates on 2 shifts per day, the effluent loading from Building 2 was adjusted to two-thirds of the values shown in Table GECS-2. The adjusted mean value for cyanide discharged from GE is approximately 68 percent of the comparable value measured in the Ley Creek Sewage Treatment Plant influent. The cyanide discharge from the plating room amounts to a significant (27 percent of the peak value) portion of the cyanide in the Ley Creek treatment plant influent.

Wastewaters from Building B were not analyzed because of low volume and infrequent occurrence. However, by discharging these wastewaters to the

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			General Electric, Court Street Building No. 2		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	0.144	0.144	0.164-0.272
BOD_5	51,073	47,791	15,354-202,419	-	-	-
BOD_{uc}	71,117	69,572	19,912-251,149	-	-	-
COD	115,965	101,879	26,309-341,738	33	29	12-104
pH	-	7.0	6.0-8.8	-	7.0	6.0-8.2
Acidity	838	0	0-6,647	9.3	0	0-54
Alkalinity	1,320	0	0-23,091	14	0	0-63
SS	74,776	54,205	1,599-325,906	28.7	27.3	11-88
VSS	36,362	29,468	-106,011	-	-	-
TS	-	-	-	342.2	355.5	295-806
Oil and Grease	10,326	8,634	2,602-22,496	-	-	-
Cyanide	8.71	1.99	0.09-95.98	5.9	3.8	1.1-26
Phenol	29.40	19.49	0.80-113.95	-	-	-
Chromium	39.91	30.37	10.19-198.87	1.09	0.61	0.5-6.0
Copper	34.65	32.48	9.09-76.22	0.33	0.21	0.2-1.2
Zinc	84.79	93.75	18.11-183.22	0.27	0.21	0.1-1.2
Cadmium	8.45	5.93	1.5-40.54	0.71	.067	0.6-1.6
Nickel	16.22	15.59	2.05-38.19	0.93	0.93	0.1-0.2
NH_3	1,873.3	1,775.2	864.1-3,540.5	-	-	-
Org-N	3,278.2	3,111.4	979.6-6,822.2	-	-	-
Ortho-PO_4	3,244	2,957	727-15,294	46.9	8.2	2.7-387
Total-PO_4	6,397	6,762	1,200-19,542	66.7	15.0	12.6-495

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

process/sanitary sewer instead of to surface disposal, potential pollution can be averted. This wastewater appears to be amenable to biological treatment.

CONCLUSIONS

Based on information obtained during plant visits and results from the sampling and analyses program, the following conclusions are made.

1. With the exception of occasional high discharges of cyanides from Building 2, the wastewater from the GE Court Street Complex appears to be compatible with biological treatment.
2. The total volume of wastewater from Building 2 is in question.
3. Wastewaters from the ceramic printing area of Building B, while generally minimal, should be included in the sanitary process sewer to reduce the potential for stream contamination.

RECOMMENDATIONS

Based upon the foregoing conclusions, the following recommendations are made:

1. Provide flow measurement in the plating room operation in Building 2. Data can be obtained by metering the plating room influent since practically all of it will be discharged to the sewer.
2. Reduce the cyanide concentration discharged from the plating operation to levels compatible with the Onondaga County "Rules and Regulations Governing the Use of Public Sewers".
3. Discharge wastewater from the cleaning and preparation areas of Building B to the sanitary/process sewer.
4. Discharge all clean uncontaminated waters to the nearby creek.

GENERAL ELECTRIC COMPANY
COURT STREET
SYRACUSE, NEW YORK

TABLE GECS-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

BLDG.2 - PLATING ROOM DIS.

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
055	06 25 68	1500	5.3	0.164	9	7.0	0	0	64	250	2.0	0.67	0.23	0.20	0.74	0.12	9.0	12.5
059	06 25 68	2300	5.7	0.216'	19	6.2	0	25	26	164	0.6	0.29	0.11	0.18	0.46	0.08	1.5	7.0
064	06 26 68	2200	13.0	0.272	19	8.2	28	0	0*	246	3.6	0.65	0.17	0.16	0.53	0.06	26.0	28.0
068	06 27 68	1525	5.8	0.216'	39	7.0	0	0	20	336	8.3	0.81	0.64	0.27	0.90	0.10	1.5	11.0
072	06 27 68	2230	7.1	0.216'	58	8.0	35	0	16	296	3.2	0.29	0.14	0.65	0.35	0.08	1.5	12.5
078	06 28 68	1450	7.2	0.216'	29	6.0	0	30	6	448	15.0	0.29	0.45	0.12	0.66	0.07	215.0	275.0
082	07 01 68	2230	14.8	0.216'	19	7.3	12	0	28	250	1.1	3.35	0.18	0.05	0.53	0.06	15.0	40.0

TABLE GECS-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

BLDG.2 - PLATING ROOM DIS.

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
055	06 25 68	1500	0.164	12	7.0	0	0	88	342	2.8	0.91	0.31	0.27	1.01	0.16	12.3	17.1
059	06 25 68	2300	0.216'	34	6.2	0	45	47	295	1.1	0.52	0.19	0.32	0.82	0.14	2.7	12.6
064	06 26 68	2200	0.272	43	8.2	63	0	0*	558	8.3	1.47	0.38	0.36	1.20	0.13	58.9	63.4
068	06 27 68	1525	0.216'	70	7.0	0	0	36	605	14.9	1.45	1.15	0.48	1.62	0.18	2.7	19.8
072	06 27 68	2230	0.216'	104	8.0	63	0	29	533	5.7	0.52	0.25	1.17	0.63	0.14	2.7	22.5
078	06 28 68	1450	0.216'	52	6.0	0	54	11	806	26.*	0.52	0.81	0.21	1.18	0.12	386.8	494.8
082	07 01 68	2230	0.216'	34	7.3	22	0	50	450	1.9	6.02	0.32	0.09	0.95	0.10	26.*	71.9

*=NO ANALYSIS
'ESTIMATE

GENERAL ELECTRIC COMPANY
COURT STREET
SYRACUSE, NEW YORK

TABLE GECS-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

BLDG.5-ALM.BRAZ.RINSE TKS O.F.

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	TS	T.CHR	COPPER	ZINC	CADM	NICKEL	CI	LI
056	06 25 68	1430	4.5	0.013	19	7.5	28	0	44	930	0.000*	0.00*	0.00*	0.00*	0.00*	37	109.0
060	06 26 68	1430	5.7	0.013	9	6.0	0	20	39	908	<0.015	0.08	0.14	<0.C1	0.35	31	24.5
067	06 27 68	1415	5.2	0.013	49	6.8	0	4	8	1148	0.000*	0.00*	0.00*	0.00*	0.00*	34	24.1
076	06 28 68	1435	6.2	0.013	78	7.0	0	0	20	1026	0.000*	0.00*	0.00*	0.00*	0.00*	37	26.1
081	07 01 68	1435	7.2	0.013	10	7.6	32	0	0	162	0.000*	0.00*	0.00*	0.00*	0.00*	0*	0.2

TABLE GECS-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

BLDG.5-ALM.BRAZ.RINSE TKS O.F.

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	TS	T.CHR	COPPER	ZINC	CADM	NICKEL	CI	LI
056	06 25 68	1430	0.013	2	7.5	3	0	5	100	0.000*	0.00*	0.00*	0.00*	0.00*	4	11.7
060	06 26 68	1430	0.013	1	6.0	0	2	4	98	<0.001	0.00	0.01	0.00	0.03	3	2.6
067	06 27 68	1415	0.013	5	6.8	0	0	1	124	0.000*	0.00*	0.00*	0.00*	0.00*	4	2.6
076	06 28 68	1435	0.013	8	7.0	0	0	2	111	0.000*	0.00*	0.00*	0.00*	0.00*	4	2.8
081	07 01 68	1435	0.013	1	7.6	3	0	0	17	0.000*	0.00*	0.00*	0.00*	0.00*	0*	0.0

*=NO ANALYSIS

GENERAL ELECTRIC COMPANY
COURT STREET
SYRACUSE, NEW YORK

TABLE GECS-5

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

BLDG.5-ALM. FINIS. AREA DIS.

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
057	06 25 68	1445	3.8	0.056[1]	29	7.0	0	0	0*	0*	0.01	<0.015	0.08	0.28	0.04	0.09	11.5	20.0
061	06 26 68	1445	6.0	0.056[1]	0	6.6	0	14	32	108	0.00*	<0.015	0.02	0.08	<0.01	0.04	18.5	20.0
066	06 27 68	1415	grab	0.066	39	6.8	0	4	8	360	0.10	0.020	0.08	0.13	<0.01	0.09	12.0	22.0
077	06 28 68	1445	6.6	0.046	19	6.9	0	<5	10	270	0.15	<0.015	0.06	0.04	0.03	0.05	3.5	17.5
088	07 02 68	1600	grab	0.345	20	7.0	0	0	24	244	0.00*	0.000*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*

TABLE GECS-6

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

BLDG.5-ALM. FINIS. AREA DIS.

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
057	06 25 68	1445	0.056	14	7.0	0	0	0*	0*	0.00	0.007	0.03	0.13	0.01	0.04	5.3	9.3
061	06 26 68	1445	0.056	0	6.6	0	7	15	51	0.00*	0.007	0.01	0.03	0.00	0.01	8.6	9.3
066	06 27 68	1415	0.066	22	6.8	0	2	4	199	0.05	0.011	0.04	0.07	0.00	0.05	6.6	12.1
077	06 28 68	1445	0.046	7	6.9	0	2	4	104	0.05	0.005	0.02	0.01	0.01	0.02	1.3	6.7
088	07 02 68	1600	0.345	58	7.0	0	0	69	702	0.00*	0.000*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*

*=NO ANALYSIS

[1]ESTIMATED

General Electric Company
Electronics Park
Syracuse, New York

MANUFACTURING PROCESSES

The Electronics Park facility of General Electric Company manufactures semi-conductors and television tubes and assembles television sets. Presently, the plant is operating 5-days per week, 24-hours per day, with 85 percent of production scheduled for the first shift. This General Electric facility is one of the larger employers in the Syracuse area. Total employment can vary depending upon production, but approximates 10,000 persons.

Although the majority of the manufacturing processes are "dry," the following operations generate process wastewaters: cleaning and preparing parts, etching, plating, rinsing, and painting.

WASTEWATER PRODUCTION AND TREATMENT

The Electronics Park facility is served by a common sanitary-process sewer and two storm sewers, designated as the East Storm and the West Storm Sewers. All sewers are shown on General Electric's reference drawing, "Storm and Sanitary Sewers and Catch Basins," a copy of which is on file but has not been made a part of this report. Because wastewater from the process sewer is discharged to the Ley Creek Sewage Treatment Plant System, its quality must meet the standards established by the Commissioner of Public Works, as outlined in the "Rules and Regulations Governing the Use of Public Sewers," which was updated on 28 February 1968. A copy of the document is enclosed in Appendix C.

Although the General Electric complex is made up of a number of buildings, the only significant sources of process wastewater are Building 5 (TV assembly), Buildings 6 and 15 (tube manufacturing), and Building 7 (semiconductor manufacturing). The quantities and characteristics of the process wastewater infrequently discharged from the laboratory facilities should be negligible.

In Building 5 (TV assembly), a cupric chloride solution is used to etch the printed circuit boards. The boards are rinsed in continuously flowing rinsewater. The resultant wastewater, carrying trace amounts of the etching

solution, is discharged to the process sewer. The etching solution is regenerated, by chlorination and reused until the copper content exceeds allowable limits for effective etching. When the solution no longer can be used, it is removed by the Chemcut Corporation for recovery of the copper.

A number of operations in Building 6 (tube manufacturing) are sources of varying quantities of wastewater. The largest source is from the tube washing operation where tubes, as received from the manufacturer, are washed with hydrofluoric acid and then rinsed. In another area where damaged tubes are salvaged, the tubes are treated with an Oakite solution to remove the coatings, cleaned with hydrofluoric acid, and rinsed. Rinsewaters from these areas are discharged to the process sewer. The chemical solution, used to coat the tube face, is periodically dumped into a sump. As required, solids are removed from this sump, and the partially clarified wastewater is pumped to the process sewer.

Essentially the same operations are conducted in Building 15 as in Building 6, but with only about 30 percent the total production capacity. Rinsewater for tube manufacturing and for the majority of the wet operations is deionized prior to use. The water is treated in two Accelators using alum and lime for treatment. The treated water is passed through ion exchange units, which are regenerated using hydrochloric acid or sodium hydroxide solutions. Wastewaters from these units including sludge blowdown are discharged to the process sewer.

In Building 7 (semi-conductor manufacturing), batch etching operations are conducted in individual hoods. Rinsewater from these operations are discharged to the process sewer. All solvents used in the building are collected in individual safety cans and removed from the building for salvage or disposal. The discharge of any solvents to the sewer from the individual stations generally would be accidental. The spent acid from the quartz tube (diffusion) etching operation is neutralized as much as possible with caustic prior to discharge. Other sources of wastewater in Building 7 are the paint spray booths. These are closed water recirculating systems, where paint is skimmed off the recirculating water and removed. Whenever required, the water is dumped to the process sewer and replaced with clean water. The plating room rinsewater discharged from this building to the sewer carries significant concentrations of plating chemicals. According to General Electric personnel, when large quantity tank or vat cleaning is required, the acid materials are neutralized before dumping to the sewer. GE personnel also indicated all cyanide solutions are accumulated for processing before disposal or returned to the vendor for disposition.

Stormwater from roof drains and parking lots and equipment cooling water are carried by the East or West Storm Sewers to Bloody Brook. A previous survey conducted by G.E. personnel indicated some contamination of the

storm sewers. A program of equipment and piping changes, including new process sewer lines, was undertaken to segregate existing contamination. After removing the contributing sources of contamination, the storm sewer flows were again sampled by GE personnel and found to be relatively free of contamination. A copy of the data was placed in the file.

Water usage at Electronics Park has been estimated at 45 million gallons per month, or 1.76 mgd. Of this total, water for sanitary and process usage is approximately 75 percent (1.32 mgd), with the resulting wastewaters discharged to the sanitary-process sewer. The balance of the water (25 percent) is used for make-up equipment cooling water (0.44 mgd) and probably is discharged either to the East or West Storm Sewers.

SAMPLING AND ANALYSIS SURVEY

A number of grab samples were taken from the sanitary-process sewer, at the manhole designated as M.H. 0-1 on the reference drawing. One grab sample was collected during both the second and third shift, while the remaining samples were collected during peak production. Furthermore, these latter samples were so spaced over the survey period as to cover approximately every hour interval of the first shift. The samples were analyzed for BOD_5, BOD_{ult}, COD, pH, alkalinity or acidity, suspended solids (SS), volatile suspended solids (VSS), oil and grease, cyanides, phenol, total chrome, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate. Results of these analyses are shown in Table GEEP-1 with the expanded (to lbs/day) data shown in Table GEEP-2.

Concurrently with sampling, flow measurements were made using the lithium dilution technique. A standard lithium chloride solution was added at a known rate to the wastewater at a point (M.H. J-2) upstream of the sampling location for at least 10 minutes before sampling. From the lithium concentrations measured in the sample, the flow rate was calculated.

Grab samples were obtained from both storm sewers. Samples were collected during the same period when samples were being collected from the sanitary-process sewer. Grab samples from the East Storm Sewer were collected at a point immediately prior to where the wastewater from the 48-inch sewer is discharged to Bloody Brook. The West Storm Sewer was sampled at a manhole, near the New York State Thruway, which is not located on General Electric property. Samples collected from both sewers were analyzed for COD, pH, alkalinity or acidity, SS, VSS, oil and grease, total chrome, copper, zinc, cadmium, and nickel. Results of these analyses are shown on Tables GEEP-3 and GEEP-4, for the East and West Storm Sewer, respectively.

Flow measurements were attempted in both storm sewers by use of the lithium dilution technique. However, the lack of adequate mixing in the sewers at the point of lithium addition (Manhole Nos. 344 and 210) precluded the use of the data.

DISCUSSION

Flow rates measured during the survey for the sanitary-process sewer indicated an average rate of 1.56 mgd. The majority flow measurements were made during the first shift, which could account for the higher rate than observed in General Electric's records. At the average observed rate, the plant contributes approximately 10 to 12 percent of the influent flow to the Ley Creek Sewage Treatment Plant.

The main contaminant observed in the process sewer was copper. Copper concentrations of 38 and 25 mg/L were found in the two samples collected on 20 August 1968. However, these were the result of a cupric chloride leak from the printed circuit board etching (Chemcut) operation in Building 5. Copper content in the wastewater after August 21 averaged approximately 0.5 mg/L. Although the high copper discharge was abnormal, it can, as demonstrated, occur. With GE contributing 10 percent of the flow to the Ley Creek Treatment Plant, copper concentrations of 2.5 to 3.8 mg/L would be present in the plant influent during the time when abnormal conditions were observed at GE. This loading could impair the biological treatment process.

A comparison of General Electric's (Electronics Park) wastewater discharge to the contaminant load entering the Ley Creek Sewage Treatment Plant is shown in Table 1. Since the loading on the Ley Creek Sewage Treatment Plant is on a daily basis, the daily contaminant discharge from GE was adjusted to one-third of the values shown in Table GEEP-2; the approximate fraction of the day when contaminants are assumed to be discharged. Flow was not adjusted because close to average rates were observed on the second and third shifts. The adjusted mean value for copper discharge from GE is approximately 75 percent of the compariable value on the Ley Creek Plant influent. The peak copper discharge was greater than that measured in the Ley Creek plant influent indicating that an abnormal condition had occurred at GE.

The low pH values in the sanitary-process sewer are unacceptable under section 3(f) of the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

Contamination observed in both the East and West Storm Sewers was generally lower than measured in previous samples collected by the General Electric Company. Several high organic concentrations (as COD) were detected

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			G. E. - Electronics Park Industrial - Sanitary Discharge		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	1.56	1.38	1.045-2.844
BOD_5	51,073	47,791	15,354-202,419	221	181	26-1469
BOD_{uc}	71,117	69,572	19,912-251,149	347	257	45-2123
COD	115,965	101,879	26,309-341,738	1044	948	89-6071
pH	-	7.0	6.0-8.8	--	3.0	2.0-6.2
Acidity	838	0	0-6,647	1288	1083	178-13411
Alkalinity	1,320	0	0-23,091	0	0	0
SS	74,776	54,205	1,599-325,906	400	378	540-1864
VSS	36,362	29,468	- -106,011	302	282	160-1784
TS	-	-	-	--	--	--
Oil and Grease	10,326	8,634	2,602-22,496	98.8	27.4	6.5-1944
Cyanide	8.71	1.99	0.09-95.98	0.007	0.008	0.011-0.029
Phenol	29.40	19.49	0.80-113.95	0.94	0.67	0.09-8.22
Chromium	39.91	30.37	10.19-198.87	0.23	0.21	0.17-1.80
Copper	34.65	32.48	9.09-76.22	26.7	3.7	2.4-367.8
Zinc	84.79	93.75	18.11-183.22	3.6	2.1	3.39-47.9
Cadmium	8.45	5.93	1.5-40.54	0.86	0.64	0.72-8.18
Nickel	16.22	15.59	2.05-38.19	0.21	0.05	0.08-2.37
NH_3	1,873.3	1,775.2	864.1-3,540.5	--	--	--
Org-N	3,278.2	3,111.4	979.6-6,822.2	--	--	--
Ortho-PO_4	3,244	2,957	727-15,294	33.2	17.8	3.5-526
Total-PO_4	6,397	6,762	1,200-19,542	54.6	20.5	5.3-1023

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

in both storm sewers. However, by diverting the contaminated flow to the sanitary-process sewer, a potential COD load would be eliminated from Bloody Creek.

The relatively high flows observed in the process sewer during the second and third shift contained a relatively low order of contamination. This would indicate the presence of relatively clean waters. The potential exists, therefore, to divert these.

CONCLUSIONS

1. The effluent flow from Electronics Park constitutes approximately 10 to 12 percent of the total influent flow to the Ley Creek Sewage Treatment Plant.
2. Wastewater pH in the sanitary-process sewer is generally below the acceptable discharge limit of 5.5 established by the Commissioner of Public Works.
3. Metal concentrations are generally insignificant, but abnormally high concentrations of copper can occur at times of equipment failure.
4. The East and West Storm Sewer flows, at the time of sampling, were relatively uncontaminated. However, occasional organic contamination does occur.

RECOMMENDATIONS

1. Neutralize the wastewaters to a pH of 5.5 to 9.0, as required for discharge to the sewer system.
2. Implement in-plant controls to prevent accidental discharge of copper and other metals.
3. Divert contaminated flows from the stormwater sewers to the sanitary-process sewers.
4. Reduce flow in the process sewer by diverting clean waters to the storm sewers.

GENERAL ELECTRIC COMPANY
ELECTRONICS PARK
SYRACUSE, NEW YORK

TABLE GEEP-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

INDUSTRIAL-SANITARY DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	OIL	CN	PHENOL	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
462	08 19 68	1200	1.163	34	64	170	0.0*	0*	0*	170	162	0.0*	0.000*	0.42	0.03	4.80	0.35	0.08	0.03	3.3	4.8
466	08 19 68	1640	1.045	3	48	594	<2.5	0	1540	62	62	9.4	0.003	0.21	0.08	1.22	0.59	0.23	<0.01	2.1	2.2
470	08 20 68	0845	1.162	29	41	594	3.0	0	204	90	76	3.8	0.003	0.85	0.06	38.00	0.77	0.29	0.01	6.8	7.5
473	08 20 68	1420	1.598	92	153	456	3.0	0	244	140	134	146.0	0.002	0.12	<0.02	25.00	3.60	0.14	<0.01	5.5	5.7
486	08 21 68	1340	1.872	60	110	120	<2.0	0	250	74	48	5.7	<0.001	0.26	0.05	0.35	0.46	0.12	<0.01	4.1	6.0
492	08 21 68	2030	1.310	12	15	100	5.2	0	20	102	20	0.6	<0.001	0.20	0.05	0.22	0.34	0.75	<0.01	1.5	3.4
503	08 22 68	0635	1.070	<5	<5	10	6.2	0	20	62	18	1.2	0.003	<0.01	<0.02	0.31	0.47	0.14	<0.01	0.4	0.6
506	08 22 68	0900	1.440	120	177	320	3.3	0	120	134	88	18.5	<0.001	<0.01	0.15	0.53	0.46	0.06	0.18	3.6	4.2
509	08 22 68	1510	2.099	84	111	197	2.8	0	270	56	54	2.8	0.001	<0.01	0.04	0.68	0.58	0.15	0.05	30.1	58.5
518	08 23 68	1030	2.844	32	39	99	<2.5	0	240	72	56	9.6	<0.001	0.25	0.04	0.62	0.58	0.16	0.10	6.5	9.0

TABLE GEEP-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

INDUSTRIAL-SANITARY DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	OIL	CN	PHENOL	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
462	08 19 68	1200	1.163	330	620	1648	0.0*	0*	0*	1648	1570	0.0*	0.000*	4.07	0.34	46.52	3.39	0.77	0.29	31.9	46.5
466	08 19 68	1640	1.045	26	418	5173	<2.5	0	13411	540	540	82.3	0.026	1.82	0.69	10.62	5.13	2.00	<0.08	18.2	19.1
470	08 20 68	0845	1.162	281	397	5750	3.0	0	1975	871	736	36.8	0.029	8.22	0.60	367.84	7.45	2.80	0.09	65.8	72.6
473	08 20 68	1420	1.598	1225	2037	6071	3.0	0	3249	1864	1784	1943.9	0.026	1.59	<0.26	332.86	47.93	1.06	<0.13	73.2	75.9
486	08 21 68	1340	1.872	936	1715	1871	<2.0	0	3898	1154	748	88.8	<0.015	4.05	0.78	5.45	7.17	1.87	<0.15	63.9	93.5
492	08 21 68	2030	1.310	131	164	1092	5.2	0	218	1113	218	6.5	<0.011	2.18	0.54	2.40	3.71	0.16	<0.11	16.3	37.1
503	08 22 68	0635	1.070	<45	<45	89	6.2	0	178	553	160	10.7	0.026	<0.09	<0.17	2.76	4.19	1.24	<0.09	3.5	5.3
506	08 22 68	0900	1.440	1439	2123	3838	3.3	0	1439	1607	1056	221.9	<0.012	<0.12	1.80	6.35	5.51	0.72	2.16	43.1	50.3
509	08 22 68	1510	2.099	1469	1941	3445	2.8	0	4722	979	944	48.9	0.017	<0.17	0.68	11.89	10.14	2.62	0.87	526.4	1023.1
518	08 23 68	1030	2.844	758	924	2345	<2.5	0	5686	1706	1327	227.4	<0.023	5.92	0.94	14.68	13.74	3.79	2.37	153.9	214.2

*=NO ANALYSIS

GENERAL ELECTRIC COMPANY
ELECTRONICS PARK
SYRACUSE, NEW YORK

TABLE GEEP-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

EAST STORM SEWER

ID	DATE	TIME	COD	PH	ALKAL	ACID	SS	VSS	OIL	T.CHR	COPPER	ZINC	CADM	NICKEL
467	08 19 68	1715	515	6.6	0	8	32	32	0.91	0.00*	0.09	0.00*	0.00*	0.00*
471	08 20 68	0945	<20	6.8	0	4	26	0*	0.00*	0.00*	0.11	0.00*	0.00*	0.00*
474	08 20 68	1405	50	6.0	0	20	26	0*	0.00*	<0.02	0.10	0.28	<0.02	<0.03
478	08 21 68	1150	90	5.8	0	24	114	0*	1.83	0.00*	0.11	0.00*	0.00*	0.00*
487	08 21 68	1410	<20	6.5	0	10	84	0*	0.00*	<0.02	0.11	0.08	<0.02	<0.03
493	08 21 68	2100	50	6.0	0	20	90	0*	0.00*	<0.02	0.13	0.06	<0.02	<0.04
504	08 22 68	0700	<20	7.3	5	0	54	0*	0.00*	<0.02	0.08	0.06	<0.02	<0.03
507	08 22 68	0920	20	6.5	0	10	20	0*	0.00*	<0.02	0.09	0.06	<0.02	<0.03
510	08 22 68	1540	<20	6.0	0	30	30	0*	1.20	<0.02	0.20	0.11	0.05	<0.03

TABLE GEEP-4

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

WEST STORM SEWER

ID	DATE	TIME	COD	PH	ALKAL	ACID	SS	OIL	T.CHR	COPPER	ZINC	CADM	NICKEL
472	08 20 68	1025	30	6.4	0	10	40	1.25	0.00*	0.10	0.00*	0.00*	0.00*
475	08 20 68	1452	0	6.6	0	8	20	3.16	0.03	0.09	0.17	0.02	0.08
479	08 21 68	1130	20	6.2	0	16	102	0.55	0.00*	0.11	0.00*	0.00*	0.00*
488	08 21 68	1352	60	5.8	0	24	108	0.00*	0.05	0.14	0.18	0.03	0.42
494	08 21 68	2045	10	6.8	0	4	70	0.00*	<0.02	0.10	0.18	<0.02	0.05
505	08 22 68	0643	180	7.3	6	0	44	0.00*	0.09	0.09	0.10	<0.02	<0.03
508	08 22 68	0905	160	7.2	4	0	36	0.00*	<0.02	0.13	0.15	<0.02	<0.03
511	08 22 68	1520	39	6.3	0	20	40	2.40	<0.02	0.13	0.22	<0.05	0.11

*=NO ANALYSIS

General Motors Corporation
Ternstedt Division
Syracuse, New York

MANUFACTURING PROCESSES

The Ternstedt Division of General Motors Corporation produces various types of automotive hardware and accessories including doorknobs, grilles, dashboard panels, hubcaps, etc. The production facilities on Townline Road are categorized according to three basic operations: 1) Plastics Department -- for injection molding and extrusion of plastics, 2) Alloy Department -- for die casting and plating of various metals, and 3) Fabrication and Plate Department -- for the plating of various metals onto the metal hardware.

WASTEWATER PRODUCTION AND TREATMENT

Ternstedt has separate sanitary, storm, and process sewers. The sanitary wastewater is discharged directly to the Ley Creek Sewage Treatment Plant System and was not considered part of our survey. Stormwater from roof drains, surface water runoff, and cooling tower blowdown are discharged via the stormwater sewer system to Ley Creek. The process sewer system carries industrial wastewaters to an on-site industrial wastewater treatment plant owned and operated by Ternstedt. Ternstedt personnel estimate that 1.5 mgd of water are used, of which approximately 1 mgd is treated in the company's wastewater treatment facility. The remaining 0.5 mgd are used for sanitary and cooling water purposes.

Wastewater contaminants resulting from production operations include copper, zinc, chrome, nickel, cyanide, cleaners, solvents and occasional dumps of other liquids. Three separate sewers convey wastewater to the treatment plant; the first carries rinsewaters from the cyanide plating operation; the second, rinsewaters and other spills from the chrome plating operation; and the third, general acid-alkali wastewater. A copy of the flow diagram for the wastewater treatment plant is on file, but not appended.

Chrome and cyanide wastewaters each flow to individual holding tanks for reduction of the chrome and oxidation of the cyanide. The wastewaters then

are combined with the general acid-alkali wastewater in a flocculation tank. After precipitation, the metal flocs are settled and the clarified wastewater discharged via a storm sewer into a holding pond with a detention period of approximately 8 hours. The holding pond effluent discharges to Ley Creek.

SAMPLING AND ANALYSIS SURVEY

A number of composite samples of the treatment plant effluent were collected over various time intervals. These samples were taken from the first manhole downstream from the point where the effluent flow enters the sewer discharging to the holding pond. Although the samples were not composited according to flow, the average flow rate for each sampling period was determined from the difference in effluent flow meter readings. The composite samples were analyzed for BOD_5, BOD_{UC}, COD, pH, alkalinity or acidity, suspended solids, cyanide, total chrome, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate. Concentrations of contaminants found are shown in Table GM-1, and the data, expanded to pounds per day, are given in Table GM-2.

Grab samples were taken from the storm sewer at a manhole located approximately on line with the main guardhouse and the northeast corner of the main building. Flow from two stormwater sewers enters this manhole; the sewer designated as "main storm sewer" is directly on line with the discharge from the manhole and points in the north-northeast direction, while the sewer designated as "secondary storm sewer" entered the manhole at a right angle to the discharge flow and pointed in an east-southeast direction. Flow was visually estimated in the main and secondary storm sewer at 100 and 25 gpm, respectively. The samples collected were analyzed for COD, pH, alkalinity or acidity, suspended solids, oil, total chrome, copper, nickel, orthophosphate, and total phosphate. The data, raw and extended (to pounds per day), obtained by analyzing the main storm sewer samples are shown in Tables GM-3 and GM-4, while the raw and extended data for the secondary sewer samples are shown in Tables GM-5 and GM-6, respectively. The combined flow is discharged into a tributary of Ley Creek.

Ternstedt personnel daily collect a flow-proportioned, composite sample of the pond effluent, which is analyzed to determine the wastewater characteristics. A representative portion of four of these daily composite samples were analyzed for COD, pH, alkalinity or acidity, suspended solids, total chrome, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate. Results of these analyses, both raw and expanded to pounds per day, are given in Tables GM-7 and GM-8, respectively.

DISCUSSION

Wastewater in the main storm sewer was sampled on four occasions. Each time a film of floating oil was observed, and on three occasions sample analyses showed significant oil concentration. The wastewater flowing from the secondary storm sewer always appeared clean and uncontaminated.

The treatment plant effluent analyses indicate complete degradation of cyanides. Organic contamination was quite small. Maximum concentrations of metals observed were as follows: chromium, 2.36 mg/L; copper, 0.80 mg/L; zinc, 1.75 mg/L; and nickel, 2.93. While these concentration levels are generally considered acceptable to biological waste treatment processes, they may not be acceptable for discharge to a stream.

The high total chromium concentrations were attributed by General Motors-Ternstedt to chromium contamination of the acid-alkali system. Chromium discharged to this system receives partial treatment through the manual addition of ferrous sulfate, but this procedure is not considered adequate. Although hexavalent chromium concentrations were not determined during this survey, previous analyses conducted by General Motors-Ternstedt indicated hexavalent chromium levels at approximately 40 to 50 percent of total chromium levels.

In general, wastewater management techniques at this plant are quite refined. A conspicuous effort is made to reduce plating chemical losses in-plant, wherever possible.

CONCLUSIONS

Based upon the results of the sampling survey, the following conclusions were drawn:

1. The organic content of the samples analyzed was not sufficient to require biological treatment.
2. Significant amounts of oil were observed in the main storm sewer.
3. Metal concentrations detected in the effluent may require additional treatment prior to discharge to Ley Creek.

RECOMMENDATIONS

1. Segregate the sources of chrome contamination from the acid-alkali sewer and discharge it to the special chrome treatment system.
2. Find and eliminate the sources of oil being discharged to the storm sewer system.
3. Maintain the high level of in-plant pollution control currently practiced.

GENERAL MOTORS CORPORATION
SYRACUSE, NEW YORK

TABLE GM-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

TREATMENT PLANT EFFLUENT

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
138	07 15 68	1445	3.2	0.975	14	14	19	7.0	0	0	16	<0.001	0.72	0.27	0.42	<0.01	0.27	1.0	2.3
149	07 16 68	0700	16.3	1.188	27	36	58	7.9	63	0	18	<0.001	2.36	0.80	0.38	<0.01	1.90	12.0	32.4
153	07 16 68	2300	6.8	1.341	25	31	39	7.1	3	0	28	<0.001	0.82	0.48	1.75	<0.01	<0.03	1.3	3.2
154	07 17 68	0700	8.0	1.068	0*	0*	39	7.2	16	0	22	0.000*	0.60	0.34	1.66	<0.01	0.70	0.9	1.7
158	07 17 68	1520	6.5	1.211	0*	0*	58	6.3	0	8	12	0.000*	0.48	0.21	0.56	<0.01	<0.03	0.6	12.6
163	07 18 68	0700	15.7	1.300	24	27	39	6.5	0	5	8	<0.001	0.84	0.43	0.19	<0.01	1.34	0.6	8.0
165	07 18 68	1520	7.0	0.902	19	21	39	6.4	0	8	10	<0.001	1.14	0.46	0.44	<0.01	1.36	0.6	7.0
174	07 19 68	1520	24.0	1.100	21	23	<10	6.1	0	10	16	<0.001	2.04	0.48	0.44	0.01	2.93	0.4	8.8

TABLE GM-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY.
FLOW IS IN MILLION GALLONS PER DAY

TREATMENT PLANT EFFLUENT

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
138	07 15 68	1445	0.975	114	114	154	7.0	0	0	130	0.008	5.84	2.19	3.41	0.08	2.19	8.1	18.6
149	07 16 68	0700	1.188	267	356	574	7.9	623	0	178	0.010	23.35	7.91	3.76	0.10	18.80	118.7	320.6
153	07 16 68	2300	1.341	279	346	436	7.1	34	0	313	0.011	9.16	5.36	19.54	0.11	0.33	14.5	35.7
154	07 17 68	0700	1.068	0*	0*	347	7.2	142	0	196	0.000*	5.33	3.02	14.76	0.09	6.22	8.0	15.1
158	07 17 68	1520	1.211	0*	0*	585	6.3	0	81	121	0.000*	4.84	2.11	5.65	0.10	0.30	6.0	129.1
163	07 18 68	0700	1.300	260	292	422	6.5	0	54	87	0.010	9.09	4.65	2.05	0.10	14.51	6.5	86.6
165	07 18 68	1520	0.902	143	158	293	6.4	0	60	75	0.007	8.56	3.45	3.30	0.07	10.21	4.5	52.6
174	07 19 68	1520	1.100	192	211	92	6.1	0	92	147	0.009	18.69	4.39	4.03	0.09	26.84	3.6	80.6

*=NO ANALYSIS

GENERAL MOTORS CORPORATION
SYRACUSE, NEW YORK

TABLE GM-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

MAIN STORM SEWER

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	OIL	T.CHR	COPPER	NICKEL	O-PO4	T-PO4
139	07 15 68	1445	0.144[1]	19	7.0	0	0	20	0.0*	0.030	0.08	0.00*	0.0*	0.0*
150	07 16 68	1640	0.144[1]	29	7.1	3	0	20	22.6	0.000*	0.00*	0.00*	0.0*	0.0*
156	07 17 68	1145	0.144[1]	19	6.2	0	10[2]	10	8.9	<0.015	0.05	0.46	1.1	1.6
171	07 19 68	0850	0.144[1]	106	8.8	280	0	78	44.4	0.000*	0.00*	0.00*	2.8	9.4

TABLE GM-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

MAIN STORM SEWER

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	OIL	T.CHR	COPPER	NICKEL	O-PO4	T-PO4
139	07 15 68	1445	0.144	23	7.0	0	0	24	0.0*	0.036	0.09	0.00*	0.0*	0.0*
150	07 16 68	1640	0.144	35	7.1	4	0	24	27.1	0.000*	0.00*	0.00*	0.0*	0.0*
156	07 17 68	1145	0.144	23	6.2	0	11	12	10.6	0.018	0.06	0.55	1.3	1.9
171	07 19 68	0850	0.144	127	8.8	336	0	94	53.2	0.000*	0.00*	0.00*	3.3	11.2

*=NO ANALYSIS
[1]VISUAL ESTIMATION
[2]ESTIMATED

GENERAL MOTORS CORPORATION
SYRACUSE, NEW YORK

TABLE GM-5

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

SECONDARY STORM SEWER

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	OIL	T.CHR	COPPER	NICKEL	O-PO4	T-PO4
157	07 17 68	1145	0.036[1]	10	6.2	0	10	10	0.0*≤0.015		0.02	≤0.13	≤0.1	13.0

TABLE GM-6

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

SECONDARY STORM SEWER

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	OIL	T.CHR	COPPER	NICKEL	O-PO4	T-PO4
157	07 17 68	1145	0.036	3	6.2	0	3	3	0.0*	0.004	0.00	0.04	0.0	3.9

*=NO ANALYSIS
[1]VISUAL ESTIMATION

GENERAL MOTORS CORPORATION
SYRACUSE, NEW YORK

TABLE GM-7

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

POND EFFLUENT

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
148	07 16 68	0900	1.080	19	7.5	22	0	16	<0.001	0.19	1.45	0.10	<0.01	<0.03	1.3	2.4
155	07 17 68	0900	1.248	39	7.5	33	0	16	<0.001	0.50	0.25	0.12	<0.01	0.72	2.5	9.2
16	07 18 68	0900	1.248	29	6.6	0	3	6	<0.001	0.52	0.45	0.39	<0.01	0.00*	0.6	1.8
170	07 19 68	0900	1.034	10	6.6	0	3	6	<0.001	0.00*	0.00*	0.00*	0.00*	0.00*	0.6	8.8

TABLE GM-8

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

POND EFFLUENT

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
148	07 16 68	0900	1.080	171	7.5	198	0	144	0.009	1.71	13.04	0.90	0.09	0.27	11.7	21.6
155	07 17 68	0900	1.248	405	7.5	343	0	166	0.010	5.19	2.60	1.24	0.10	7.48	25.*	95.6
166	07 18 68	0900	1.248	301	6.6	0	31	62	0.010	5.40	4.67	4.05	0.10	0.00*	6.2	18.7
170	07 19 68	0900	1.034	86	6.6	0	26	52	0.008	0.00*	0.00*	0.00*	0.00*	0.00*	5.1	75.8

*=NO ANALYSIS

General Super Plating Company, Inc.
5781 Bridge Street
East Syracuse, New York

MANUFACTURING PROCESSES

The General Super Plating Company, Inc. (GSP), is a relatively large "job shop" operation, and electroplates a wide variety of metals onto an assortment of parts. Listed below are the major plating operations together with the general types of chemicals used.

Gold Plate
- Acid-gold solution

Hard Chrome Plate - Miscellaneous Decorative Plating
- Alkali solutions
- Electro-polish solution

Copper-Nickel Plate
- Nickel sulfate solution
- Tin stanate solution
- Copper cyanide solution

Nickel-Chrome Plate
- Nickel-chrome solution

Hand Zinc and Cadmium Plate
- Zinc-cyanide solution
- Cadmium-cyanide solution
- Oxidizing solutions

Plastic Plate

Plastic Line Plate
- Ammonia-nickel solutions
- Acid-copper solution
- Nickel-sulfate solution

Barrel Plate
- Zinc-cyanide solutions
- Cadmium-cyanide solutions
- Potassium stanate solution
- Copper-cyanide solution
- Silver-cyanide solution

Barrel Automatic Plate
- Zinc cyanide solution
- Oxidizing solution

Anodizing Area
- Anodizing solutions
- Various dyes

Silver Area
- Silver-cyanide solutions
- Nickel solution
- Tin lead solution
- Brass solution

Strip Room

Each particular operation has a number of rinse tanks, some with countercurrent flow. Alkaline cleaners and various types of acid solutions are also used in the majority of the operations.

GSP employs a total of 65 persons; 60 on the first shift and 5 on the second shift. No indication as to length of shifts was given. The normal work week is 5 days.

WASTEWATER PRODUCTION AND TREATMENT

The major volume of process wastewater results from rinse tank overflow, but spills, leaks, and general clean-ups contribute to the total flow. Primary contaminants are cyanides, metals, acids, and alkalis.

Based upon previous water bills, water use is approximately 140,000 gallons per day. Of this total, approximately 1,000 gallons per day would be used in the sanitary facilities, with practically all of the remaining water used in the rinse tanks. According to GSP personnel, water consumption over the past two years has been decreasing because of the increased use of countercurrent flow and air entraining devices in rinse tanks. The combined sanitary and process wastewater flow is discharged to the Ley Creek Sewer System.

SAMPLING AND ANALYSIS SURVEY

Grab and composite samples were taken from the discharge of a common manhole where process wastewaters from different areas of the plant combine. Samples were collected between 8:20 a.m. and 4:00 p.m., on August 5 through 9, 1968. This period should encompass representative operations during the first shift. No samples were taken during the second shift. Samples obtained were analyzed for chemical oxygen demand (COD), suspended solids (SS), volatile suspended solids (VSS), total solids (TS), pH, alkalinity or acidity, cyanides, total chromium, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate.

Flow determinations were made over the sampling period by reading the influent flow meter at the start and end of the sampling period and/or by the lithium dilution technique. This latter procedure involves adding a known rate of a predetermined lithium chloride solution upstream of the sampling point. Lithium concentration measured in the sample allowed the calculation of the flow rate over the sampling period.

Survey data, raw and extended (to pounds per day), are shown in Tables GSP-1 and GSP-2, respectively.

DISCUSSION

Flow rates determined by the lithium dilution technique were consistently between 80 and 86 percent of the flow rates taken from influent flow meter readings. Measured values were used when expanding the data to pounds per day except for those instances when only flow meter rates were available. In these special cases the effluent flow was assumed at 85 percent of the measured influent flow. Because of the variable work schedule, a "normal" work day of 14.2 hours was calculated from the fairly consistent water use rate of 164 gpm and the daily water consumption of 140,000 gpd measured during the sampling survey.

Total contaminant discharge from GSP as compared to the influent loading on the Ley Creek Sewage Treatment Plant is shown on Table 1. Since the loading on the Ley Creek Sewage Treatment Plant is the actual daily loading, the GSP mean and median values for the "normal" 14.2 hour production-day were calculated by taking 59 percent (ratio of 14.2/24) of the daily discharge rates given in Table GSP-2. Based upon the comparison of the mean data shown in Table 1, GSP contributes approximately 36 percent of the chromium and 13.5 percent of the copper. The mean nickel and cyanide are greater than the loading to the Ley Creek Sewage Treatment Plant; an anomaly that can best be explained by the fact that the surveys were conducted during different periods and over different time intervals.

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			General Super Plating Co., Inc. Effluent		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	.119	.119	0.19-0.21
BOD_5	51,073	47,791	15,354-202,419	--	--	--
BOD_{uc}	71,117	69,572	19,912-251,149	--	--	--
COD	115,965	101,879	26,309-341,738	60	50	18-294
pH	-	7.0	6.0-8.8	--	6.0	2.6-8.6
Acidity	838	0	0-6,647	--	--	--
Alkalinity	1,320	0	0-23,091	--	--	--
SS	74,776	54,205	1,599-325,906	36	27	21-136
VSS	36,362	29,468	- -106,011	9	5	2-39
TS	-	-	-	576	606	677-1248
Oil and Grease	10,326	8,634	2,602-22,496	--	--	--
Cyanide	8.71	1.99	0.09-95.98	13.8	14.3	6.3-37.8
Phenol	29.40	19.49	0.80-113.95	--	--	--
Chromium	39.91	30.37	10.19-198.87	14.3	16.4	0.05-50.4
Copper	34.65	32.48	9.09-76.22	4.7	5.2	0.08-13.1
Zinc	84.79	93.75	18.11-183.22	3.3	4.2	0-8.7
Cadmium	8.45	5.93	1.5-40.54	3.2	2.2	0-7.6
Nickel	16.22	15.59	2.05-38.19	22.6	5.6	0.2-218.6
NH_3	1,873.3	1,775.2	864.1-3,540.5	--	--	--
Org-N	3,278.2	3,111.4	979.6-6,822.2	--	--	--
Ortho-PO_4	3,244	2,957	727-15,294	0.9	1.0	0.3-2.9
Total-PO_4	6,397	6,762	1,200-19,542	3.5	2.9	1.3-11.8

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

Cyanide, total chromium, copper, and nickel concentrations measured in GSP effluent are in themselves of sufficient magnitude to be toxic to biological treatment. Since composite samples actually yield average concentrations over the sampling period, higher concentrations of contaminants can be expected over short periods of time than were actually measured. Although a biological toxicity problem was not apparent at the Ley Creek Sewage Treatment Plant, concentrations of toxic materials must be reduced to eliminate possible problems in the future. Discharging materials that result in a toxic condition at the treatment plant is in violation of Section 3(g) of "Rules and Regulations Governing the Use of Public Sewers."

Effluent pH values are variable, indicating the discharge of large volumes of acids or alkalis. During the survey, pH values of less than the allowable discharge pH of 5.5 were observed. This condition is in violation of section 3(f) of the above-named code.

National Super Plating in general recognizes the problem and is currently evaluating the possibility of substituting caustic for a portion of the cyanide used in cyanide plating operations. By reducing the amount of cyanide used, concentrations in the effluent should be decreased accordingly.

CONCLUSIONS

Effluent pH values occasionally exceed allowable discharge limits. Cyanide and certain metal concentrations in GSP effluent comprise a significant portion of the comparable contaminants measured in the Ley Creek Sewage Treatment influent.

RECOMMENDATIONS

1. Adjust all acids and alkalis wastewater streams to acceptable pH levels before discharging to the sewer. Partial neutralization can be effected by simultaneously discharging the acid and alkaline wastewaters.
2. Reduce the discharge concentrations of cyanides and metals to avert potential damage to the biological treatment process.
3. Install safeguards to avoid the accidental (leaks, spills, etc.) discharge or batch dumps of contaminants.

GENERAL SUPER PLATING COMPANY, INC.
EAST SYRACUSE, NEW YORK

TABLE GSP-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

PLATING ROOM DISCHARGE

ID	DATE	TIME	FLOW	COD	SS	VSS	TS	PH	ALKAL	ACID	CYAN.	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
391	08 05 68	1600	0.201	60	81	0*	743	7.5	10	0	3.8	30.00	7.80	3.50	2.25	10.00	1.12	1.40
395	08 06 68	1453	0.198	59	28	4	590	2.6	0	130	13.1	16.80	6.85	4.30	7.84	0.62	1.00	3.00
396	08 06 68	1440	0.211	10	12	1	384	6.0	0	20	8.4	0.03	0.05	0.12	0.03	0.12	0.19	0.73
401	08 07 68	0820	0.198	20	14	1	432	5.5	0	30	14.7	21.45	5.55	4.50	0.61	5.75	1.42	7.10
410	08 07 68	1442	0.204	50	44	18	603	6.7	0	6	22.2	0.42	5.20	1.95	3.00	0.86	0.46	2.27
415	08 08 68	1434	0.194	50	54	24	664	8.6	70	0	21.2	23.00	5.30	5.40	7.70	135.00	1.80	7.24
419	08 09 68	1343	0.201	175	24	6	654	5.4	0	48	15.0	11.00	2.60	4.20	1.82	12.80	0.50	3.25

TABLE GSP-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

PLATING ROOM DISCHARGE

ID	DATE	TIME	FLOW	COD	SS	VSS	TS	PH	ALKAL	ACID	CYAN.	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
391	08 05 68	1600	0.201	101	136	0*	1248	7.5	17	0	6.3	50.38	13.09	5.87	3.77	16.79	1.88	2.35
395	08 06 68	1453	0.198	98	46	7	977	2.6	0	215	21.6	27.81	11.34	7.11	12.97	1.02	1.65	4.96
396	08 06 68	1440	0.211	18	21	2	677	6.0	0	35	14.8	0.05	0.08	0.21	0.05	0.21	0.33	1.28
401	08 07 68	0820	0.198	33	23	2	715	5.5	0	50	24.3	35.50	9.18	7.45	1.01	9.51	2.35	11.75
410	08 07 68	1442	0.204	85	75	31	1027	6.7	0	10	37.8	0.71	8.85	3.32	5.11	1.46	0.78	3.86
415	08 08 68	1434	0.194	81	87	39	1075	8.6	113	0	34.3	37.24	8.58	8.74	12.47	218.61	2.91	11.72
419	08 09 68	1343	0.201	294	40	10	1098	5.4	0	81	25.2	18.47	4.36	7.05	3.05	21.49	0.84	5.45

*=NO ANALYSIS

Green's Paste Works
200 Liverpool Road
Liverpool, New York

MANUFACTURING PROCESSES

Green's Paste Works manufactures a flour/water adhesive paste for library, school, and office uses. There is one employee. The paste is made on a batch basis, heated, and subsequently cooled.

WASTEWATER PRODUCTION AND TREATMENT

Wastewater is produced as a result of the paste cooling operations. Total waste usage is estimated at 300 gallons per day. An estimated 230 gallons/day of cooling water and 20 gallons/day of sanitary wastewaters are discharged to the Ley Creek Sewerage System. The remainder (50 gallons/day) is included in the finished product.

SAMPLING AND ANALYSIS SURVEY

No samples were collected.

CONCLUSIONS

There is no significant industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge the wastewater described above to the Ley Creek Sewerage System.

Hoffman Industries
Division of Clarkson Industries
Thompson Road and James Street
Syracuse, New York

MANUFACTURING PROCESSES

Hoffman Industries manufactures blowers, stationary vacuum cleaning systems, and filtration equipment. Unit production processes include welding, parts cleaning and rinsing, paint spraying, and assembly. Currently, 107 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Very little industrial wastewater is generated in this type of plant. The paint spray booth is the source of a low-volume of wastewater. The initial charge is recirculated for 3 to 4 weeks before the paint is skimmed off for removal to a dump. Approximately 2,000 gallons of wastewater are discharged to the sewer. The alkaline cleaning tank wastewater is periodically dumped on company property. An estimated 1,100 gallons per day of sanitary wastewater is discharged to the Ley Creek Sewerage System. Approximately 10,000 gallons per day of cooling water are discharged to surface drainage, according to plant personnel.

Based on previous water bills, Hoffman Industries was buying about 38,000 gallons of water per day. According to company personnel, a leak in the main was found which was responsible for the large water usage. After the leak was repaired, water usage had declined but was still higher than expected.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

No significant wastewater problem was apparent at this plant, but an excessive amount of water was being used.

RECOMMENDATIONS

1. Continue to discharge contaminated wastewater to the Ley Creek Sewage System and clean, uncontaminated wastewater to surface drainage or a storm sewer system.
2. Determine and correct the cause of the excessive water use.

Industrial Fabricating Corp.
4 Collamar Circle
East Syracuse, New York

MANUFACTURING PROCESSES

The Industrial Fabricating Corp. operates strictly as a "job shop" for sheet metal and welding operations. However, some painting is also performed. At present, they employ 25-30 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The process water in this plant is limited to cooling water for a 25-HP air compressor, a spot welder, and a heliarc welder. The cooling water for the welders is totally recycled, while cooling water for the air compressor is discharged to the ground.

An estimated 300 gallons per day of sanitary wastewater is discharged to the Ley Creek Sewerage System. It is contemplated that the air compressor cooling water will be tied into the sewer system in the near future.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.
2. Do not discharge clean cooling water to the Ley Creek Sewerage System.

Iroquois Door Company
101 Kuhn Road
Syracuse, New York

MANUFACTURING PROCESSES

The Iroquois Door Company cuts and fabricates wood into doors and other wood products. Occasionally, wood is treated in a chlorinated phenolic solvent. The wood is placed in a completely closed tank of solvent for a designated period of time and then allowed to drain. Presently, 50 persons are employed on an 8-hour per day, 6-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

An estimated 500 gallons per day of sanitary wastewater are discharged to a septic tank system, but the overflow appears to seep into a ditch running parallel to the plant.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no process wastewater problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the septic tank system as long as it is adequate and appropriate.

Jessel Marking Equipment Company
2207 Teall Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Jessel Marking Equipment Company produces rubber stamps for ink marking on a "job shop" basis. Eleven persons are presently employed for 8 hours per day, 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

The only process wastewater generated is the cooling water used in the vulcanizing press. An estimated 200 gallons per day are discharged to the ground outside the building.

The estimated 110 gallons per day of sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

This wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.

W. C. Jones Machine Products Company
Brewerton Road
Syracuse, New York

MANUFACTURING PROCESSES

The W. C. Jones Machine Products Company, manufacturers of various screw machine products, presently employs seven persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated. Oil is removed from metal chips by centrifuging and reused until it is spent. About once a week three to five gallons of the spent oil are dumped outside of the building. The oil almost immediately soaks into the ground. The machined metal parts are occasionally cleaned in a solution of Solvasol 7, which is dumped once a week outside the building (approximately five gallons).

An estimated 150 gallons per day of sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.
2. Oil wastes should be handled by a scavenger.

Kilian Manufacturing Corporation
1728 Burnet Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Kilian Manufacturing Corporation produces unground ball bearing rings and assembles them into usable parts. About 85 tons of steel are heat treated on-site. In the production facilities about 170 machines are available for drilling, grinding, cutting, and other operations required to make the ball bearings. Approximately 250 people are employed on the first shift and 75 people on the second shift. The plant operates 14 hours per day, five days per week.

Note: Subsequent investigations have determined that this industry is in the Metropolitan Sanitary District. Therefore, the wastewater was not sampled.

WASTEWATER PRODUCTION AND TREATMENT

Most of the process wastewater is generated in a heat-treating operation, where the metal parts which have been placed in a basket are dipped into a solution of molten sodium cyanide. Scrubber water, from the off-gas scrubbing process, is discharged through the sewer. About 60-70 percent of the metal parts removed from sodium cyanide solution are quenched in a continuous-flow rinsewater bath. The rinsewater is discharged to the sewer. The remainder are quenched in an oil bath, but the oil remains in the tanks.

Each of the 170 machines at the facility uses a small amount of cooling water, which is discharged to the sewer. However, the oil used for cooling and cutting on the machines is recirculated, filtered, and reused. The oil is never dumped but, occasionally, make-up oil has to be added. Oil drippings are collected on sawdust and removed by a trash collector.

The process wastewaters (10,000 gallons per day) are combined with the estimated 4,500 gallons of sanitary wastewater and discharged to the Metropolitan Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled since it discharges to the Metropolitan Sewage Treatment Plant.

CONCLUSIONS

Possible contaminants present in the process wastewater are cyanides, oil, and organics.

Lamson Division
Diebold, Inc.
100 Lamson Street
Syracuse, New York

MANUFACTURING PROCESSES

The Lamson Division of Diebold, Inc., fabricates various metal parts into air tube systems, blowers, and other material handling systems. Unit manufacturing processes include cutting, stamping, grinding, and painting. At present, 540 people are employed on the first shift and 60 people on the second shift. The plant normally operates 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

Process wastewater generation at this facility is minimal. The cooling system using emulsified oil to cool machines (lathes and grinders) in the fabricating operation is completely closed. When the oil is spent, it is put in drums and hauled to a disposal site. A dry scrubbing system is used in the paint spray booths.

Plant records show that the total water usage is 430,000 gallons every three months, which is an average of 12 gpd per employee. This is approximately the expected average for sanitary usage in this type of industry. The sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewaters were not sampled.

CONCLUSIONS

There is no wastewater disposal problem.

RECOMMENDATIONS

Continue to dispose of sanitary wastewaters to the Ley Creek Sewerage System.

Lemoyne Machine Products Corporation
106 Evlyn Terrace
Syracuse, New York

MANUFACTURING PROCESSES

The Lemoyne Machine Products Corporation is a "job shop" machine products company. Four persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

There appears to be no measurable quantities of industrial wastewater discharged from this plant. Based on observations, none of the machines utilize water or oil for cooling purposes.

An estimated 40 gpd of sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Lennox Industries, Inc.
400 North Midler Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Lennox Industries, Inc., manufactures heating and air conditioning units from roll steel. Metal is pressed into forms, cleaned, painted, and fabricated. Currently, 230 persons are employed on the first shift and 48 persons on the second shift. The plant normally operates 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

Of the seven buildings located at the Lennox facility, wastewater is discharged into the sewer system only from Buildings 3 and 4. Two air compressors between Buildings 2 and 3 are used alternately, and the cooling water is discharged to the sewer.

Process wastewater from Building 3 consists of cooling water from ten spot welders and from three exhaust fans. This wastewater is discharged to the sewer. Water used in a paint spray booth in Building 3 is recirculated for one week. Then, the paint is skimmed off the surface, placed into drums, and hauled to a dump; and the water is discharged from the sump to the sewer (approximately 2,000 gallons per week).

In Building 4, wastewater is primarily generated in a phosphatizing process, consisting of:

1. Detergent and hot water washing.
2. Hot water rinsing.
3. Coat with Oakite CrysCoat SW (a mixture of approximately 400 gallons of water and 8 gallons of Oakite. The tanks are dumped every six to eight weeks to the sewer.)
4. Hot water rinsing.
5. Etching with a solution of Oakite FH (approximately 300 gallons of water and one pint of Oakite are used in this solution. It is discharged to the sewer the same time as the Oakite CrysCoat SW solution).

In Building 4 the cooling water from the spot welding operations is discharged to the sewer. The small machine shop has three machines that are either water or oil cooled. However, each machine is on a closed system and the liquid is recycled until spent. All spent solutions are placed in drums and hauled to a disposal site.

An estimated 2,800 gallons per day of sanitary wastewaters are discharged to the Ley Creek Sewerage System. Subtracting this from the total plant water usage, approximately 35,000 gallons of cooling water are discharged to the sewer each working day.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There appear to be no toxic materials being discharged from the plant. However, a significant volume of clean cooling water is being discharged to the sewer.

RECOMMENDATIONS

1. Continue to discharge contaminated wastewaters described above to the Ley Creek Sewerage System.
2. Recycle clean cooling waters or discharge to a storm sewer or local stream.

Liberty Combustion Corp.
Moore Road
Syracuse, New York

MANUFACTURING PROCESSES

The Liberty Combustion Corp. manufactures various types of combustion equipment. Unit manufacturing processes include metal cleaning and welding. At present, eight persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The major sources of process wastewater are the rinsing and cooling operations. Rinsing follows immersion of the metal in an alkaline cleaning solution (Oakite). Both the rinsewaters and the alkaline cleaning solution (when spent) are discharged to floor drains leading to a ditch running parallel to the New York State Thruway. Rinsewaters are discharged continuously, while spent alkaline cleaning solutions are discharged twice per year. Cooling waters from the welding machine discharge continuously to the above mentioned floor drain.

Total water usage at this industry is uncertain since public water service has been obtained only recently. Sanitary water use is estimated at 80 gallons per day. Total wastewater discharge is estimated at 1,100 gallons per day.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.
2. Discharge rinse tank overflow and alkaline cleaning solution to the Ley Creek Sewerage System.

Lis Brothers
Electronics Parkway
Liverpool, New York

MANUFACTURING PROCESSES

Lis Brothers is a metal stamping operation, employing three persons on an 8-hour per day, 5-1/2 days per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The plant was not visited. A telephone interview with the Plant Manager, Mr. Frank Lis, indicated that no process wastewater, oil, or solvents are discharged to the sewer. Experience with similar operations would indicate that this is typical.

An estimated 30 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Mark's Machine and Tool Corporation
102 Wavel Street
Syracuse, New York

MANUFACTURING PROCESSES

Mark's Machine and Tool Corporation, operating on a "job shop" basis, is a machine and metal working operation. At present, 52 persons are employed on an 8-hour per day, 5-1/2 days per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Total water use is approximately 1,400 gallons per day. This volume can be accounted for in large part by employee sanitary usage. It is estimated that approximately 1,000 gallons per day of sanitary wastewater is discharged to the Ley Creek Sewerage System.

Water used to cool two large grinding machines is recirculated. Periodically, it is dumped on the plant's property.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Mastech, Inc.
Pickard Building
East Molloy Road
Syracuse, New York

MANUFACTURING PROCESSES

Mastech, Inc., assembles and tests electronic components on a "job shop" basis. In addition, the company also has a small sheet metal shop. A total of 50 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewaters are generated. However, an estimated 500 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Mathew Lumber Co., Inc.
4269 James Street
Syracuse, New York

MANUFACTURING PROCESSES

The Mathew Lumber Co., Inc., is a retail outlet for lumber and other building supplies. In addition, wood products, such as kitchen cabinets, are made on site. At present, six persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated nor is the lumber treated with pentachlorophenol. All sawdust is collected and hauled to a disposal site.

Approximately 60 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

McIntosh Box & Lumber Co., Inc.
110 East First Street
P. O. Box 127
East Syracuse, New York

MANUFACTURING PROCESSES

The McIntosh Box & Lumber Co., Inc., manufactures wooden boxes and performs other types of millwork on a "job shop" basis. At present, 13 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated during the millwork operations. It is estimated that 130 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Meloon Foundries, Inc.
1841 Lemoyne Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Meloon Foundries, Inc., produces aluminum and bronze castings at a rate of approximately one and a half million pounds per year. Presently, 36 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated at this facility. However, about 1,700 gallons of water per day are used to moisten sand used for castings.

An estimated 700 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Metal Finishing Supply, Inc.
320 West Second Street
East Syracuse, New York

MANUFACTURING PROCESSES

Metal Finishing Supply, Inc., assembles plating racks from prefinished pieces, and coats the racks by dipping them into vats of various mixtures, such as PVC, epoxy, and nylon. Vapor degreasing is employed prior to coating. At present, seven persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Approximately 1,180 gallons per day of cooling water are generated from the vapor degreaser. Sanitary water usage is estimated at 70 gallons per day. All wastewaters are discharged to the Ley Creek Sewerage System.

Since the protective coatings are quite valuable, they are never discarded.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge wastewater described above to the Ley Creek Sewerage System.

Morse Manufacturing Co., Inc.
727 West Manlius Road
Syracuse, New York

MANUFACTURING PROCESSES

The Morse Manufacturing Co., Inc., manufactures drum and barrel handling equipment. Metal parts are drilled and welded in assembling the finished product. At present, 16 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated. Oil used to cool two drilling machines is in a closed-system operation and is never dumped to the sewer. After assembly, barrel handling equipment is dipped in a paint bath and drained. However, the paint is salvaged and reused.

An estimated 160 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.

Mutual Library Bindery
1018 Cadillac Street
Syracuse, New York

MANUFACTURING PROCESSES

The Mutual Library Bindery binds and rebinds books, magazines, and other articles. Currently, 29 persons are employed on a 9-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated during the binding operation. Some water is used in the glue for the binding operation. Glue is rarely discharged to the sewer.

Stormwater plus an estimated 300 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge the wastewaters as described above to the Ley Creek Sewerage System.

National Plating Co., Inc.
1501 Brewerton Road
Syracuse, New York

MANUFACTURING PROCESSES

The National Plating Co., Inc., is primarily engaged in zinc, copper, nickel, and cadmium metal plating. In addition, other metal finishing processes, such as anodizing and bright dipping, are conducted.

The four major areas in the plant have been designated by National Plating as Bright Chrome and Nickel Plating, Barrel Plating, Anodizing, and Still Plating sections. A description of each of these plating operations together with schematic flow diagrams are contained in the files but have not been made a part of this report. A partial list of raw materials used at National Plating are:

1. Acids - chromic, sulfuric, boric, nitric, hydrochloric

2. Metals and Metal Salts - zinc, brass, nickel, cadmium, tin stannate, copper cyanide, potassium cyanide, nickel chloride, nickel sulfate, silver potassium cyanide

3. Alkalis - alkaline cleaners, sodium hydroxide, caustic oxide

The National Plating Co., Inc., employs approximately 20 persons, and is in production 8 hours per day, 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

The primary sources of wastewater are the rinsing operations where excess chemicals are removed. Other wastewaters resulting from spills, leaks, and general clean-up operations along with the rinsewaters are discharged through floor drains to a sump in the middle of the plant. The sump overflow is discharged to the Ley Creek Sewerage System.

Effluent flow is not monitored at this plant. However, practically all water entering the plant will be discharged as industrial wastewater. Influent flow

records indicate an average water use of 31,000 gallons per working day. Since the working day is approximately 8 hours, average flow rates during working hours are estimated at 93,500 gallons per day.

The estimated 200 gallons per day of sanitary sewage, although segregated from process wastewaters, also are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

Composite and grab samples were collected from the process wastewater sump during the period from August 5 through August 9, 1968. Flow estimations were based on influent flow meter readings made at the beginning and end of each sampling period. Analyses performed on the samples included COD, pH, alkalinity or acidity, suspended solids, volatile solids, total solids, cyanides, total chromium, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate.

Concentrations of contaminants found in the wastewaters are shown in Table NP-1, while loads expressed in pounds per day are presented in Table NP-2.

DISCUSSION

The wastewater analyses indicate relatively high concentrations of cyanides and metals. However, the total poundage discharged was relatively low. A pH as low as 2.5 in a 7.5 hour composite sample was observed. In Table 1 effluent contaminant loads are compared to the general level of contaminant loadings measured in the Ley Creek Sewage Treatment Plant influent. The Ley Creek Treatment Plant sampling survey data were representative of the wastewater received during a 24-hour daily period. However, since National Plating operates only 8 hours per day, the mean and median levels shown in Table 1 were adjusted to approximately one-third of those shown in Table NP-2.

On a mean (average) basis, National Plating contributes approximately 18 percent of the cyanide, 2.5 percent of the chromium, and 7 percent of the nickel received at the Ley Creek Treatment Plant. However, the fraction contributed on a short term "slug loading" basis probably would be considerably higher. Although no toxicity problem is apparent at the Ley Creek Sewage Treatment Plant, discharging materials that could result in toxic conditions at the sewage treatment plant is in violation of the updated Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			National Plating Co., Inc. Effluent		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	0.03	0.03	0.09-0.11
BOD_5	51,073	47,791	15,354-202,419	--	--	--
BOD_{uc}	71,117	69,572	19,912-251,149	--	--	--
COD	115,965	101,879	26,309-341,738	12	13	8-80
pH	-	7.0	6.0-8.8	--	5.7	2.5-6.6
Acidity	838	0	0-6,647	11	6	7-116
Alkalinity	1,320	0	0-23,091	0	0	0
SS	74,776	54,205	1,599-325,906	8	6	12-63
VSS	36,362	29,468	- -106,011	2	2.6	0-12
TS	-	-	-	109	108	241-427
Oil and Grease	10,326	8,634	2,602-22,496	--	--	--
Cyanide	8.71	1.99	0.09-95.98	1.6	1.4	3.0-8.2
Phenol	29.40	19.49	0.80-113.95	--	--	--
Chromium	39.91	30.37	10.19-198.87	1.0	0.3	0.2-12.8
Copper	34.65	32.48	9.09-76.22	0.4	0.3	0.8-3.1
Zinc	84.79	93.75	18.11-183.22	0.6	0.5	1.0-2.5
Cadmium	8.45	5.93	1.5-40.54	0.4	0.2	0.2-3.5
Nickel	16.22	15.59	2.05-38.19	1.2	1.1	0.7-7.1
NH_3	1,873.3	1,775.2	864.1-3,540.5	--	--	--
Org-N	3,278.2	3,111.4	979.6-6,822.2	--	--	--
Ortho-PO_4	3,244	2,957	727-15,294	0.1	0.9	0.06-1.4
Total-PO_4	6,397	6,762	1,200-19,542	0.4	0.3	0.3-2.5

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted, and are given in pounds per operating day.

CONCLUSIONS

National Plating discharges a wastewater containing significant concentrations of metals and cyanide and which exhibited an extremely low value of pH for an extended period of time. The future impact of this wastewater on biological treatment at the Ley Creek plant does not in itself appear critical; however, when combined with similar contaminants from other industries, biological treatment processes could be impaired. Through improved operating practices, pollutant levels can be minimized, thereby reducing a potential problem.

The low pH values observed are clearly unacceptable under Section 3 (f) of the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

1. Evaluate in-plant control methods to reduce flow and concentrations of cyanide and metals. Consider possible techniques, such as air agitation of rinse tanks, countercurrent staging of rinsewater flow, and reduction of chemical drag-out.
2. Provide facilities for prevention of batch dumps or accidental discharges of leaks, spills, etc., containing metals, cyanides, acids, or alkalis.
3. Maintain wastewater pH between 5.5 and 9.0.

NATIONAL PLATING CO., INC.
SYRACUSE, NEW YORK

TABLE NP-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

PLATING ROOM WASTEWATERS

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	VSS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
390	08 05 68	1610	4.8	0.110	50	6.0	0	20	21	0*	352	5.0	3.80	0.86	1.25	0.25	5.70	0.21	0.83
397	08 06 68	1000	2.0	0.099	49	6.1	0	10	76	10	484	8.4	1.24	3.70	1.71	1.17	0.81	0.33	1.38
402	08 07 68	0932	grab	0.104	39	6.6	0	8	14	0	277	3.8	0.44	0.92	1.20	0.23	3.85	0.07	0.35
403	08 07 68	1519	7.4	0.096	99	2.5	0	144	20	0	531	3.8	3.42	1.42	2.27	0.44	5.30	0.48	1.42
417	08 08 68	1515	grab	0.102	10	5.4	0	30	24	14	338	5.0	0.24	1.13	2.90	4.10	3.30	1.70	3.00
418	08 08 68	1518	7.2	0.092	10	5.7	0	20	22	14	328	10.7	0.76	2.12	2.20	3.10	2.75	0.50	1.45
420	08 09 68	1430	6.4	0.091	59	5.0	0	60	34	6	467	4.9	17.00	1.25	2.00	0.90	9.40	0.35	1.25

TABLE NP-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

PLATING ROOM WASTEWATERS

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	VSS	TS	CN	T.CHR	COPPER	ZINC	CADM	NICKEL	O-PO4	T-PO4
390	08 05 68	1610	0.110	46	6.0	0	18	19	0*	323	4.5	3.48	0.78	1.14	0.23	5.22	0.19	0.76
397	08 06 68	1000	0.099	41	6.1	0	8	63	8	401	6.9	1.02	3.06	1.41	0.97	0.67	0.27	1.14
402	08 07 68	0932	0.104	34	6.6	0	7	12	0	241	3.3	0.38	0.80	1.04	0.20	3.34	0.06	0.30
403	08 07 68	1519	0.096	80	2.5	0	116	16	0	427	3.0	2.75	1.14	1.82	0.35	4.26	0.38	1.14
417	08 08 68	1515	0.102	8	5.4	0	25	20	12	287	4.2	0.20	0.96	2.46	3.48	2.80	1.44	2.94
418	08 08 68	1518	0.092	8	5.7	0	15	17	11	253	8.2	0.58	1.63	1.69	2.39	2.12	0.38	1.11
420	08 09 68	1430	0.091	45	5.0	0	45	26	5	354	3.7	12.88	0.94	1.51	0.68	7.12	0.26	0.94

*=NO ANALYSIS

Oberdorfer Foundries, Inc.
Box 1125
Thompson Road
Syracuse, New York

MANUFACTURING PROCESSES

Oberdorfer Foundries, Inc., is a large foundry producing aluminum and bronze castings. Sand and the primary metal are the principal raw materials. The sand is pre-washed by the supplier. Normally, the plant operates on a 5-day work schedule and employs 500 persons on the first shift and 30 persons on the second shift.

WASTEWATER PRODUCTION AND TREATMENT

No wastewater is discharged from process operations. Of the total daily water usage, approximately 76,000 gallons, a large percentage is used to maintain a 2 percent moisture content in the casting sand. Cooling water (except from the air compressors) is recycled through a concrete cooling pond. Approximately 25,000 gallons per day of compressor cooling waters are discharged to the creek together with the stormwater runoff. Current plans are to include the air compressor cooling waters into this system in the near future.

Oberdorfer Foundries utilizes wet cyclone scrubbing for the reduction of air borne solids in the foundry. Solids scrubbed from the air are filtered from the liquid and removed to a disposal site. The liquid remains in the closed system and is never dumped to the sewer. Make-up water is occasionally added. The sanitary wastewater flow has been estimated at 10,000 gallons per day and is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no apparent industrial wastewater problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System and clean cooling water to the creek.

Onondaga Tool Machine Company
2013 Teall Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Onondaga Tool Machine Company machines metal parts and presently employs 6 persons on an 8-hour per day, 5-1/2 days per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The 40 gallons of water needed in the closed system to cool four machines is never dumped. Approximately 100 gallons of make-up water per week must be added.

Oil is also used on a closed-system basis. Metal scraps are allowed to settle out of the oil in a series of chambers and are then manually removed. Although make-up oil is added periodically, the system has to be drained occasionally. The spent oil is collected and dumped on the back end of the property.

An estimated 90 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.
2. Waste oil should be handled by a scavenger.

Orco Office Records Company, Inc.
103 Worth Avenue
East Syracuse, New York

MANUFACTURING PROCESSES

Orco Office Records Company, Inc., located in a predominantly residential area, packages papers to make binders and folders.

WASTEWATER PRODUCTION AND TREATMENT

Since an appointment could not be made to visit the plant, it was impossible to determine possible sources of wastewater or estimate water used for sanitary purposes.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled. The plant site was visited and the stream was inspected both upstream and downstream of the plant. No discernible difference in quality was detected.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Ascertain wastewater quantity and disposal method employed.

Paliotta Iron Works
228 Bridge Street
East Syracuse, New York

MANUFACTURING PROCESSES

The Paliotta Iron Works cuts metal and welds it into steps, rails, and other iron products. Presently, five people are employed at this facility on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated during production operations.

An estimated 50 gallons per day of sanitary wastewater are discharged to the sewer.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Pattern Maker's, Inc.
Thompson Road
Syracuse, New York

MANUFACTURING PROCESSES

Pattern Maker's, Inc., manufactures various metal and wood patterns. Metal is machined and wood cut into specified precision patterns. The company employs 40 persons for 8 hours per day, 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

All machines used in this operation are air cooled; therefore, no process wastewater is generated.

Sanitary wastewater, estimated at 400 gpd, is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Penny Curtiss Baking Co., Inc.
1810 Leymoyne Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Penny Curtiss Baking Company, Inc., makes bread and pastry. Ingredients are mixed and baked in pans that are in turn placed in trays. Currently, 80 persons are employed on an 8 hours per day, 5 days per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Process wastewater is generated in floor washing, pan and tray washing, and machine cleaning. Approximately 29,000 gallons per day of washwater, containing small amounts of flour and sugar, are discharged to the sewer. Although cooling water used for refrigeration, air compression and boiler condensate losses is recirculated through a cooling tower, an estimated 10,000 gallons are lost to the sewer.

An estimated 800 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

Organic contamination discharged from this location should be compatible with biological treatment. The concentration of contaminants may occasionally exceed the allowable discharge limits set forth in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Continue to discharge wastewaters as described above to the Ley Creek Sewerage System.

Pepsi-Cola Syracuse Bottlers, Inc.
Tarbel Road
Syracuse, New York

MANUFACTURING PROCESSES

Pepsi-Cola Syracuse Bottlers, Inc., produces bottled soft drinks. In addition to bottling, unit processes include bottle washing and syrup preparation. Currently, 103 persons are employed, including 28 truck drivers. The normal work schedule is 8-hours per day, 5-days per week.

WASTEWATER PRODUCTION AND TREATMENT

The empty returnable bottles are cleaned and washed in an automated machine before being refilled. Soap and a caustic solution are added to softened water in which the bottles are washed. Debris, straws, paper, and cigarettes screened from the washwater are hauled, along with broken glass, to a dump site. According to plant personnel, the water is reused for a limited number of washings before being discharged through floor drains to a sump and then to the sewer. There are two production lines using a common wastewater sump.

Syrup used in the manufacturing process is brought in in tank trucks and stored in a vat. As syrup is needed, it is pumped to the bottling operation and injected into the cleaned bottles. When spills occur, they are flushed with water to the floor drain system.

Total water use approximates 64,000 gallons per day. The great majority of this water is used in the soft drinks themselves.

Lime and chlorine are added to the water supply in the Pepsi-Cola water treatment plant. This mixture is settled and the supernatant filtered through carbon, sand, and anthracite filters. The treated water is dechlorinated before being used in soft drinks. Filter backwash is discharged to the sewer.

Wastewaters from the shower and sanitary facilities, estimated at 1,000 gallons per day, are combined with process wastewater before being discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

A relatively low volume of process wastewater containing organic contamination is discharged to the Ley Creek Sewerage System. This contamination should be compatible with biological treatment. This contamination may occasionally exceed the allowable BOD_5 discharge limits set forth in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Continue to discharge wastewater as described above to the Ley Creek Sewerage System.

Prestolite Division
Eltra Corporation
219 Lamson Street
Syracuse, New York

MANUFACTURING PROCESSES

The Prestolite Company manufactures direct current motors of various sizes and description. The type of motors produced include electric windshield wiper motors, marine starting motors and generators, fractional horsepower and automotive-type motors, and heavy-duty industrial life truck motors and generators. Although motor sizes and end uses vary widely, unit manufacturing processes are quite similar and include: machining, parts washing, heat treating, plating, and final assembly.

Currently, 950 persons are employed, with 850 working the first shift, and the balance on the second shift. The normal work week is 5 days.

WASTEWATER PRODUCTION AND TREATMENT

According to Prestolite records, total water usage is approximately 12.75 million gallons per month or, roughly, 600,000 gallons per day based on a 5-day week. Prestolite personnel estimate that about 50 percent is used for cooling water and the balance for process and sanitary purposes.

The three sewer systems collecting wastewaters have been designated by Prestolite as the sanitary, storm, and process sewers. Sanitary wastewaters are discharged to the Ley Creek Sewerage System. In addition to roof drainage and cooling waters, parts washwaters are discharged to the storm sewer. The discharge location of the storm sewer was not determined: however, Prestolite personnel indicated they had traced this discharge to surface disposal. The process sewer is separated into two systems for cyanide and general acid wastewaters. Cyanide-bearing plating room rinsewaters are segregated and discharged to one of two parallel tanks in a fill-and-draw batch treatment system. After a tank is filled, the cyanide wastewaters are oxidized with chlorine in the presence of sodium hydroxide (alkaline chlorination). They are then discharged into a third tank where they combine with the wastewaters from the acid wastewater sewer system. If the pH of the

combined flow is acidic, sodium hydroxide is added to neutralize the wastewaters prior to discharge. This wastewater (according to Prestolite personnel) discharges into the Ley Creek Sewerage System. Dye tracer tests conducted on the effluent from the Prestolite treatment plant indicated that these wastewaters did not mix with the storm sewage prior to discharge to the elevated manhole in back of the treatment plant. The ultimate discharge point of the plant effluent is thus in doubt.

SAMPLING AND ANALYSIS SURVEY

A wastewater sampling survey was conducted between July 9 and July 15, 1968. Composite and grab samples were obtained of the treatment plant effluent in the discharge pipe. Grab samples of the storm sewer flow were collected at the elevated manhole. The samples were analyzed for chemical oxygen demand (COD), suspended solids (SS), volatile suspended solids (VSS), pH, alkalinity or acidity, oil, cyanide, total chromium, copper, zinc, cadmium, nickel, orthophosphate, and total phosphate.

Concurrent with sampling, the flow rate in the storm sewer was determined by the lithium dilution technique. A standard lithium chloride solution was added at a known rate upstream of the sampling point. Flow was calculated from the concentration of lithium measured in the sample. No measurable rain fell during the sampling period, therefore the average rate of 34,000 gallons per day should be cooling water and parts washwaters.

The treatment plant effluent flow was not measured since the long retention time in the neutralization tank was not conducive to the use of the lithium dilution technique for flow measurement. Influent water meter readings taken during the survey indicated the use of approximately 440,000 gallons during the principal production shift (first shift) and 210,000 gallons during the remainder of the day. After reducing these flows by the sanitary and cooling water requirements, an estimated 400,000 gallons (or a daily rate of 1.2 mgd) are discharged from the treatment plant during the first shift and an estimated 200,000 gallons during the remaining 16 hours. Since some composite samples were collected over more than one shift, the flow values used in Table PRES-1 have been adjusted to reflect the best estimate of flow.

As described previously, the treatment plant effluent is a combination of wastewaters from the cyanide treatment system and the acid rinse waters. The total volume of treated cyanide-bearing wastewaters averages 36,000 gallons per day; three separate 12,000 gallon volumes treated on a fill-and-draw basis. Each discharges to the neutralization tank over a 1.5 hour period. The flow rates to the neutralization tank increase by approximately 190,000 gallons per day during the draining periods.

DISCUSSION

Analytical data, raw and extended to pounds per day, on the treatment plant effluent are shown in Tables PRES-1 and PRES-2, respectively. Raw and extended data collected on the storm sewer are shown in Tables PRES-3 and PRES-4, respectively.

Analysis of the composite samples taken on the treatment plant effluent indicates high concentrations of cyanides in the composite samples collected on July 10 and 11, 1968, during the first shift. These composites were for 6 and 5.5 hours, respectively. Based upon records kept by the Prestolite treatment plant operator, the cyanide-treated wastewater, during the collection of these two composite samples, was discharged for 70 minutes on the 10th and 75 minutes on the 11th of July. For the cyanide concentration in the composite sample to be as high as was observed, either the cyanide treatment system was relatively ineffective or other sources of cyanide are contaminating the acid wastewater sewer. Although two analyses are not conclusive, this wastewater could be a major source of cyanides in the Ley Creek Treatment Plant influent.

Measured discharge concentrations of copper, chromium, and zinc do not, in themselves, appear to be toxic to aerobic sewage treatment processes. However, effluent metal concentrations should be reduced as low as possible to avoid a potential problem. The pH of this discharge wastewater was generally in a neutral range, but two samples exhibited low pH values (4.8 and 5.0).

Analyses of the process-storm sewer samples indicate pH values generally between 5 and 6. This wastewater appears to be relatively clean except for an occasional undesirable contaminant level. A COD concentration of 168 mg/L, a suspended solids concentration of 252 mg/L, an oil concentration of 10.7 mg/L and a total phosphate concentration of 147.5 mg/L have been observed in samples taken at various times. These concentrations indicate contamination of the storm sewer system.

CONCLUSIONS

Based upon our initial visit and the sampling and analysis survey conducted at Prestolite, the following conclusions are made:

1. The destination of the flow in both the storm sewer and the treatment plant effluent is not definitely known.
2. At the measured concentrations of cyanide and the estimated flow, the Prestolite effluent can contain a significant portion of the cyanide concentration entering the Ley Creek Sewage Treatment Plant.
3. The storm sewer system is contaminated.

RECOMMENDATIONS

Based upon the above conclusions, the following recommendations are made:

1. Install a flow measuring device on the effluent from the neutralization tank in the Prestolite Treatment Plant.
2. Determine the destination of flows in both the storm sewer and the treatment plant effluent.
3. Segregate all roof leaders, clean cooling water, and other sources of uncontaminated waters from process wastewaters. These clean waters should not be discharged to the Ley Creek Sewerage System.
4. Optimize cyanide treatment to insure against high effluent concentrations. If cyanide contamination exists in the acid sewer, segregate and divert the flow to the cyanide treatment system.
5. Neutralize all wastewaters to between pH 5.5 and 9.0 before discharge.
6. Remove sources of contamination from storm water system and discharge to the process sewer.

PRESTOLITE DIVISION
ELTRA CORPORATION
SYRACUSE, NEW YORK

TABLE PRES-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

TREATMENT PLANT EFFLUENT

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	SS	VSS	PH	ALKAL.	ACID.	OIL	CN-	T.CHR.	COPPER	ZINC	CADM.	NICKEL	O-PO4	T-PO4
102	07 09 68	1515	3.5	1.200	10	42	6	6.0	0	20	0.0*	0.23	0.59	0.04	3.50	0.73	<0.03	2.4	12.5
107	07 10 68	0930	18.3	0.400	19	30	2	4.8	0	60	0.0*	0.00*	1.26	0.20	4.30	1.11	0.06	3.5	8.5
112	07 10 68	1520	6.0	1.200	10	4	0	5.0	0	56	0.0*	3.90	0.68	1.37	3.33	0.76	0.02	1.3	3.5
118	07 11 68	0925	18.1	0.400	10	20	0	7.6	12	0	0.0*	0.12	0.45	0.79	3.10	1.00	0.06	1.7	5.4
120	07 11 68	1455	5.5	1.200	10	78	14	7.0	0	0	0.0*	5.20	0.46	2.48	4.60	1.50	<0.03	0.9	3.4
131	07 12 68	1435	23.6	0.605	17	58	12	6.7	0	2	0.0*	0.11	0.85	0.22	5.20	0.71	0.18	1.3	9.5
136	07 15 68	1400	grab	1.200	0*	0*	0*	0.0*	0*	0*	5.8	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*

TABLE PRES-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

TREATMENT PLANT EFFLUENT

ID	DATE	TIME	FLOW	COD	SS	VSS	PH	ALKAL.	ACID.	OIL	CN-	T.CHR.	COPPER	ZINC	CADM.	NICKEL	O-PO4	T-PO4
102	07 09 68	1515	1.200	**	420	60	6.0	0	200	0.0*	2.30	5.89	0.40	34.98	7.29	<0.30	24.0	124.9
107	07 10 68	0930	0.400	63	100	7	4.8	0	200	0.0*	0.00*	4.19	0.66	14.32	3.69	0.20	11.6	28.3
112	07 10 68	1520	1.200	**	40	0	5.0	0	560	0.0*	38.98	6.79	13.69	33.28	7.59	0.20	13.0	34.9
118	07 11 68	0925	0.400	33	67	0	7.6	40	0	0.0*	0.40	1.50	2.63	10.33	3.33	0.20	5.6	18.0
120	07 11 68	1455	1.200	**	780	140	7.0	0	0	0.0*	51.98	4.59	24.79	45.98	14.99	<0.30	9.0	33.9
131	07 12 68	1435	0.605	86	292	60	6.7	0	10	0.0*	0.55	4.28	1.10	26.20	3.57	0.90	6.5	47.8
136	07 15 68	1400	1.200	0*	0*	0*	0.0*	0*	0*	57.9	0.00*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*

**=NO ANALYSIS

PRESTOLITE DIVISION
ELTRA CORPORATION
SYRACUSE, NEW YORK

TABLE PRES-3

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

PROCESS-STORM SEWER DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	SS	VSS	PH	ALKAL.	ACID.	OIL	CN-	T.CHR.	COPPER	ZINC	CADM.	NICKEL	O-PO4	T-PO4
098	07 09 68	1150	0.016	24	33	68	22	12	5.8	0	114	0.0*	0.058	<0.02	0.10	0.14	<0.01	<0.01	2.9	7.5
103	07 09 68	1515	0.072	0*	0*	19	20	8	6.0	0	20	0.0*	0.039	<0.02	0.12	0.08	<0.01	0.02	1.1	4.5
108	07 10 68	0925	0.051	0*	0*	78	252	26	6.0	0	50	0.0*	0.033	0.03	0.33	0.33	<0.01	0.03	140.0	147.5
113	07 10 68	1545	0.006	0*	0*	168	18	18	6.0	0	6	0.0*	0.043	<0.02	0.03	0.57	<0.01	0.02	1.0	3.4
119	07 11 68	0940	0.028	0*	0*	20	0	0	5.0	0	45	0.0*	<0.010	0.02	<0.01	0.11	<0.01	<0.01	0.6	2.0
121	07 11 68	1445	0.044	0*	0*	10	62	8	6.0	0	40	0.0*	0.018	<0.02	0.08	0.43	<0.01	0.02	1.1	4.0
128	07 12 68	1150	0.018	0*	0*	20	26	0	7.4	4	0	0.0*	<0.010	0.02	0.07	0.11	<0.01	0.04	2.2	5.0
137	07 15 68	1350	0.036	0*	0*	0*	0*	0*	0.0*	0*	0*	10.7	0.000*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*

TABLE PRES-4

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

PROCESS-STORM SEWER DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	SS	VSS	PH	ALKAL.	ACID.	OIL	CN-	T.CHR.	COPPER	ZINC	CADM.	NICKEL	O-PO4	T-PO4
098	07 09 68	1150	0.016	3	5	10	22	2	0.8	0	16	0.0*	0.008	0.00	0.01	0.02	0.00	0.00	0.4	1.0
103	07 09 68	1515	0.072	0*	0*	11	20	5	3.6	0	12	0.0*	0.023	<0.01	0.07	0.04	0.00	0.01	0.6	2.7
108	07 10 68	0925	0.051	0*	0*	34	252	11	2.6	0	22	0.0*	0.014	0.01	0.14	0.14	0.00	0.01	60.4	63.7
113	07 10 68	1545	0.006	0*	0*	9	18	1	0.3	0	0	0.0*	0.002	0.00	0.00	0.03	0.00	0.00	0.0	0.1
119	07 11 68	0940	0.028	0*	0*	5	0	0	1.2	0	11	0.0*	<0.002	0.00	0.00	0.02	0.00	0.00	0.1	0.4
121	07 11 68	1445	0.044	0*	0*	4	62	3	2.2	0	15	0.0*	0.006	0.00	0.03	0.15	0.00	0.00	0.4	1.4
128	07 12 68	1150	0.018	0*	0*	3	26	0	1.1	1	0	0.0*	<0.001	0.00	0.01	0.01	0.00	0.00	0.3	0.7
137	07 15 68	1350	0.036	0*	0*	0*	0*	0*	0.0*	0*	0*	3.2	0.000*	0.00*	0.00*	0.00*	0.00*	0.00*	0.0*	0.0*

*=NO ANALYSIS

Prince Tool and Die Lab, Inc.
108 Luther Avenue
Liverpool, New York

MANUFACTURING PROCESSES

Prince Tool and Die Lab, Inc., operates on a "job shop" basis, specializing in manufacturing tools and dies for industry. At present, three or four persons are employed on an 8-hour per day, 6 days per week basis.

WASTEWATER PRODUCTION

No process wastewater is generated, and approximately 100 gallons a day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Radar Design Corporation
104 Pickard Drive
Syracuse, New York

MANUFACTURING PROCESSES

Radar Design Corporation manufactures electronic components, then assembles and tests them. Steel cabinets are made in the machine shop. At present, 22 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

There is no process wastewater.

Based on the water bill, about 500 gallons per day of sanitary wastewater are generated and discharged to the Ley Creek Sewerage System. Although this is a somewhat high average daily rate per person, it is within the normal usage range.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Ralph Packing Company
Greenhouse Bros., Inc.
Pilgrim Packing Co., Inc.
Burnet Avenue and Clark Street
East Syracuse, New York

MANUFACTURING PROCESSES

Three companies, Ralph Packing Company; Greenhouse Bros., Inc.,; and Pilgrim Packing Co., Inc., are located in the same building complex. They are engaged in various operations involving the slaughtering of cattle and the production of meat products. Because the companies discharge their process wastewaters through a common sewer, they will be treated as a single entity and, henceforth, shall be referred to as Ralph Packing Company. Combined employment is 40 persons, and the normal work day is 8 to 10 hours, five days per week.

According to Ralph Packing personnel, approximately 200 calves and 100 cattle are slaughtered weekly during the 2-3 days of slaughtering. In addition, approximately 1,200 pounds of processed beef and pork are purchased each week, which are used in making sausages, frankfurters, hamburger, and other meat products. Meat processing is a 10-hour per day, 5-day per week operation.

WASTEWATER PRODUCTION AND TREATMENT

The majority of the wastewater is generated during the slaughtering operation. Washwaters from the clean-up of rendering equipment, floors and tables, and meat processing equipment are discharged to the sewer as is the compressor cooling water. In addition, all blood and paunch manure are discharged to the sewer.

Both Ralph Packing Co. and Pilgrim Packing Co., Inc. have an influent water meter. Total water used by both companies, based upon previous water bills was 750,000 cu.ft. per six months or an average of 50,000 gallons per working day. Based on estimates by Ralph Packing personnel, about 50 percent of the water is used as once-through cooling water.

All wastewater including sanitary (an estimated 400 gpd) is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

During the period from September 4 through 6, 1968, grab samples of the combined wastewaters were collected. All samples were taken during the normal work day, when slaughtering or meat processing was in operation. Wastewater was sampled at a manhole located near the intersection of Burnet and Clark Streets. A photograph of the sampling location is on file, but has not been appended. Samples collected were analyzed for five-day and ultimate carbonaceous Biochemical Oxygen Demand (BOD_5 and BOD_{UC} respectively) Chemical Oxygen Demand (COD), pH, alkalinity or acidity, suspended solids (SS), volatile suspended solids (VSS), grease, ammonia nitrogen, total organic nitrogen, orthophosphate, and total phosphate.

An average flow rate at the time of sampling was calculated by reading each of two water meters before and after grab sampling.

The results of the sampling and analysis survey are presented in Table RP-1. The rates of contaminant emission expressed in pounds per day are shown in Table RP-2.

DISCUSSION

The equipment cooling water requirement, as previously estimated is approximately 50 percent of the total water purchased, or 25,000 gpd. While this wastewater was not sampled separately, this type of cooling water is generally free of contamination. If this wastewater is free of contamination, the potential exists for water reuse or diversion of the flow to a storm sewer.

The sampling and analysis survey showed a wastewater high in oxygen demand, grease, and solids. Organic contamination during slaughtering generally ranged between 1,000 to 2,000 mg/L COD with a maximum of 19,000 mg/L COD. Suspended solids during slaughtering and processing generally ranged from 100 mg/L to 1,000 mg/L with a maximum of 4,240 mg/L. The maximum observed rate of grease discharge was 7,950 mg/L. High concentrations of paunch manure, grease, and blood were observed for relatively short periods of time. Moreover, the wastewater was highly variable in quality; samples taken as little as five minutes apart show approximately a tenfold variation in contaminant levels.

A comparison of the wastewater discharge from Ralph Packing Co. et al with the influent of the Ley Creek Sewage Treatment Plant is presented in Table 1. Since the data for the Ley Creek Sewage Plant is the actual daily loading, the mean and median daily contaminant loading from Ralph Packing Co. were adjusted to approximately one-third the values listed in Table RP-2 to obtain the actual loading based on an 8-hour work day. Note, however, that

Table 1

Wastewater Characteristics
Pounds Per Operating Day

Parameter[1]	Ley Creek STP Influent			Ralph Packing Company		
	Mean	Median	Range	Mean[2]	Median[2]	Instantaneous Rate
Flow (MGD)	13.7	14.0	8.7-18.8	0.040	-	.095-0.204
BOD_5	51,073	47,791	15,354-202,419	325	-	24-4,900
BOD_{uc}	71,117	69,572	19,912-251,149	700	-	32-11,000
COD	115,965	101,879	26,309-341,738	1,400	-	58-32,400
pH	-	7.0	6.0-8.8	-	6.4	5.5-6.6
Acidity	838	0	0-6,647	-	-	-
Alkalinity	1,320	0	0-23,091	-	-	-
SS	74,776	54,205	1,599-325,906	350	-	25-7,200
VSS	36,362	29,468	- -106,011	330	-	11-6,900
TS	-	-	-	-	-	-
Oil and Grease	10,326	8,634	2,602-22,496	500	-	2-13,500
Cyanide	8.71	1.99	0.09-95.98	-	-	-
Phenol	29.40	19.49	0.80-113.95	-	-	-
Chromium	39.91	30.37	10.19-198.87	-	-	-
Copper	34.65	32.48	9.09-76.22	-	-	-
Zinc	84.79	93.75	18.11-183.22	-	-	-
Cadmium	8.45	5.93	1.5-40.54	-	-	-
Nickel	16.22	15.59	2.05-38.19	-	-	-
NH_3	1,873.3	1,775.2	864.1-3,540.5	10	-	3-140
Org-N	3,278.2	3,111.4	979.6-6,822.2	30	-	1-420
Ortho-PO_4	3,244	2,957	727-15,294	12	-	2-170
Total-PO_4	6,397	6,762	1,200-19,542	20	-	4-270

[1]Pounds per day except as noted.
[2]Mean and Median values have been adjusted and are given in pounds per operating day.

the range values are unadjusted and show the loadings as a daily rate. The comparison shown in Table 1 indicates that on a mean operating day basis, Ralph Packing Co. discharges approximately 1 percent of the COD, 0.4 percent of the suspended solids, and 5 percent of the oil and grease received at the Ley Creek Sewage Treatment Plant. The relative contributions on an instantaneous rate basis compared to the respective Ley Creek Sewage Treatment Plant peak values are 10 percent of the COD, 2 percent of suspended solids, and 60 percent of the grease. While additional sampling could be conducted to fully verify these percentages, their general level definitely indicates the direction for future wastewater management programs.

On 28 February 1968 the Commissioner of Public Works set forth allowable wastewater discharge limits entitled "Rules and Regulations Governing the Use of Public Sewers". A copy of these rules and regulations can be found in Appendix C. Wastewater discharge from Ralph Packing Co. exceed the allowable limits with regard to grease, suspended solids (paunch manure) and Biochemical Oxygen Demand (BOD). Furthermore, the rules and regulations prohibit the discharging of clean cooling waters to the sanitary sewer although such discharge is allowed to combined sewers.

CONCLUSIONS

Based on the result of preliminary discussion and the sampling and analysis survey, it is concluded that the total wastewater effluent from Ralph Packing et al contains excessive quantities of organic material on a "shock load" basis during slaughtering and processing operations. Such shock loads are primarily a result of discharges of blood, grease, and paunch manure.

RECOMMENDATIONS

Based on the above conclusion, the following recommendations are made:

1. Investigate alternate means for disposal of blood.
2. Segregate and collect all paunch manure for disposal to landfill.
3. Install and properly maintain grease traps on all process sewers.
4. Recirculate compressor cooling water or discharge to a storm sewer system.

RALPH PACKING COMPANY
EAST SYRACUSE, NEW YORK

TABLE RP-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

INDUSTR. WASTEWATER DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	GREASE	NH	TON	O-PO4	T-PO4
524	09 04 68	1430	0.121	432	1224	1685	0.0*	0*	0*	800	704	114.5	5.6	5.6	48.5	69.5
525	09 04 68	1530	0.110	438	966	890	6.4	0	18	288	254	88.5	16.8	64.5	4.8	30.0
528	09 05 68	0830	0.095	750	1500	1740	6.2	0	25	280	240	88.4	3.4	90.6	29.0	71.5
529	09 05 68	0940	0.098	516	1140	1040	6.4	0	18	120	120	0.0*	4.8	78.5	10.6	16.2
530	09 05 68	1050	0.110	984	2040	1980	6.4	0	18	96	96	4.2	154.0	182.0	2.6	12.0
531	09 05 68	1145	0.098	576	1320	1780	6.5	0	15	1350	1110	233.0	6.7	62.7	75.0	143.0
533	09 05 68	1355	0.144	1650	3290	2870	6.4	0	18	628	580	58.3	8.7	266.0	25.2	56.0
534	09 05 68	1605	0.204	2880	6480	19000	5.5	0	310	4240	4040	7950.0	14.6	244.0	**.0	160.0
538	09 06 68	0915	0.108	27	36	65	6.6	0	12	28	12	2.4	1.1	1.3	2.3	4.6
539	09 06 68	1010	0.108	564	1110	1845	5.8	0	56	1136	1012	495.0	3.8	20.9	23.6	30.0
540	09 06 68	1015	0.108	102	150	265	6.3	0	24	146	112	37.7	6.2	9.1	9.6	20.0

TABLE RP-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

INDUSTR. WASTEWATER DISCHARGE

ID	DATE	TIME	FLOW	BOD5	BODUC	COD	PH	ALKAL	ACID	SS	VSS	GREASE	NH	TON	O-PO4	T-PO4
524	09 04 68	1430	0.121	435	1233	1698	0.0*	0*	0*	806	709	115.3	5.6	5.6	48.8	70.0
525	09 04 68	1530	0.110	405	892	822	6.4	0	17	266	235	81.7	15.5	59.5	4.4	27.7
528	09 05 68	0830	0.095	594	1188	1378	6.2	0	20	222	190	69.9	2.7	71.7	22.9	56.6
529	09 05 68	0940	0.098	421	930	848	6.4	0	15	98	98	0.0*	3.9	64.0	8.6	13.2
530	09 05 68	1050	0.110	909	1884	1829	6.4	0	17	89	89	3.8	142.2	168.1	2.4	11.0
531	09 05 68	1145	0.098	470	1077	1452	6.5	0	12	1101	905	190.0	5.4	51.1	61.1	116.6
533	09 05 68	1355	0.144	1979	3946	3443	6.4	0	22	753	696	69.9	10.4	319.0	30.2	67.1
534	09 05 68	1605	0.204	4906	11037	32363	5.5	0	528	7222	6881	13541.3	24.8	415.6	170.3	272.5
538	09 06 68	0915	0.108	24	32	58	6.6	0	11	25	11	2.1	0.*	1.1	2.0	4.1
539	09 06 68	1010	0.108	507	999	1660	5.8	0	50	1022	910	445.3	3.4	18.8	21.2	26.*
540	09 06 68	1015	0.108	92	135	238	6.3	0	22	131	101	33.9	5.5	8.1	8.6	18.0

Roth Brothers Metal Company
and
Roth Smelting Company
Thompson Road
Syracuse, New York

MANUFACTURING PROCESSES

Roth Brothers Metal Company cuts, cubes, and packages scrap aluminum. Using this packaged aluminum, Roth Smelting Company conducts a secondary aluminum smelting operation (including chlorine lancing) to make ingots. At present, 100 persons are employed at the two companies on a 10-hour day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Relatively small amounts of water (less than 5,000 gallons per day) are used as cooling water and in a scrubber on the chlorine lance system. However, Roth Brothers Metal Company is in the process of installing a water scrubber for air pollution control on its furnace. The resulting wastewater will have to be clarified before being discharged to the sewer.

Combined monthly water usage for both companies is about 37,000 gallons of water per day. Employee sanitary usage is estimated at 2,000 gallons per day. Additional sources of wastewater include truck washing, and sanitary usage by non-employees (truck drivers), but these sources are not considered large enough to account for the total water usage.

All sanitary and process wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

Based on discussions with plant personnel, there did not appear to be an industrial wastewater disposal problem at the present time. However, large volumes of water were unaccounted for. The future installation of an air pollution control scrubber would generate a wastewater that would require additional attention.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.
2. Conduct a water use survey to resolve the discrepancy between the estimated and actual water use.
3. Discharge uncontaminated waters to a storm sewer or surface runoff system.

Salt City Supply Co.
Arterial Road
Syracuse, New York

MANUFACTURING PROCESSES

Salt City Supply Co., formerly the Susco Block Company, wholesales and retails building supplies.

WASTEWATER PRODUCTION AND TREATMENT

Since no manufacturing is performed, no process wastewater is generated. Sanitary wastewater is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Sanford Fire Apparatus Corp.
Manlius Center Road and Fischer Road
East Syracuse, New York

MANUFACTURING PROCESSES

Sanford Fire Apparatus Corp. cuts, assembles, and fabricates sheet metal into fire truck bodies. Primarily, the operations consist of welding and painting. No metal parts are cleaned or plated. The company presently employs 30 persons on a 9-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated during fabrication. The large paint spray booth is cleaned by a filter system. An estimated 300 gallons per day of sanitary wastewater are discharged to a septic tank system on the plant grounds. Stormwater is discharged to a surface drain. This plant was found to be outside the Ley Creek drainage area.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the septic tank system as long as this method is adequate and appropriate.

Sanitary Processing Equipment Corp.
Butternut Drive
East Syracuse, New York

MANUFACTURING PROCESSES

Sanitary Processing Equipment Corporation is a "job shop" specializing in the fabrication of specialty heat exchangers from stainless steel. At present, it employs 12 persons on an 8-hour per day, 5-1/2 days per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Water consumption is approximately 230 gallons per day, most of which is sanitary in origin. The wastewater is discharged to a septic tank system. A small amount of water, used to test the air tightness of the heat exchangers, is dumped on the ground behind the plant.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewaters to the septic tank as long as it is adequate and appropriate.

Sawyer Industries, Inc.
4001 New Court Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Sawyer Industries, Inc., manufactures sprockets and gears from steel, cast iron, and cast steel. It also distributes and warehouses similar products made by other companies. At present, it employs 15 persons, 8 in the manufacturing section and 7 in the warehouse area for 8 hours per day, 5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated because all machines for machining and grinding have recirculating lubrication baths which operate on a closed system and are never dumped.

An estimated 160 gallons per day of sanitary wastewater are discharged to a septic tank.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the septic tank as long as it is adequate and appropriate.

Schroeder Machines Corp.
New Court Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Schroeder Machines Corp. manufactures specialized packaging machinery. Currently, it employs 38 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated but approximately 400-500 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System

E. L. Seiter Lumber Co.
321 West Second Street
East Syracuse, New York

MANUFACTURING PROCESSES

E. L. Seiter Lumber Co., operates on a "job shop" basis, manufacturing pallets and skids. Currently, eight persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No water is used in production areas. An estimated 80 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Selflock Screw Products Co.
West Manlius and Marcy Streets
East Syracuse, New York

MANUFACTURING PROCESSES

The Selflock Screw Products Company is a tool and die operation, which grinds, threads, and taps metals for various machine parts. At present, it employs 20 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Cooling water for four grinding machines is continually recirculated through a closed system. Occasionally, it is dumped to the sewer. Two small wash tanks containing a soda ash solution for cleaning metal parts are also occasionally dumped to the sewer. As a final cleaning process, metal parts are placed into a tank containing trichloroethylene. When this solution is contaminated, most of it is reclaimed and sent to a reprocessor; the small amount remaining is discharged to the sewer. Fourteen screw machines are cooled by oil on a closed-system basis. Metal chips are filtered out, and the oil is reused.

An estimated 200 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Shanahan Tool and Die Corp.
115 Leo Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Shanahan Tool and Die Corp. machines various types of metal parts. Currently, 12 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Only two machines use cutting oil, and this is dumped on the property approximately once every one or two months.

An estimated 120 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.
2. Cutting oil should be handled by a scavenger.

Siefen Compounds, Inc.
215 Genant Drive
Syracuse, New York

MANUFACTURING PROCESSES

Siefen Compounds, Inc., produces liquid buffing compounds in batch operations. Raw materials, including glycerides, fatty acids, tallow, mineral oil, tripoli, alumina, silica, aluminum oxide, and Dowicide are blended in varying proportions with water. A total of 1.9 million pounds of various types of buffing compounds were made in 1967. Currently, four persons are employed on an 8-hour per day, 5-day per week basis.

Note: Subsequent investigations have indicated that this industry is in the Metropolitan Sanitary District.

WASTEWATER PRODUCTION AND TREATMENT

Approximately 1,400 gallons of water are used during a normal production day. Of this, 480 gallons per day are used in the compounding operation.

Process wastewaters, approximately 880 gallons per day, are limited to the discharge from barrel washing and process equipment washing operations. Process equipment wash-up occurs only when changing from one grade of buffing compounds to another grade. All process wastewater is discharged through a common sump, where solids settle out. The supernatant, which is still cloudy and probably contaminated, is discharged to the sewer. When the sump is filled, the solids are removed manually and hauled to a dump.

An estimated 40 gallons per day of sanitary wastewater are discharged to the sewer.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

No significant industrial wastewater problem exists at this plant.

RECOMMENDATIONS

1. Continue to discharge wastewaters described above to the sewer.
2. Clean the sump frequently after barrel washings to minimize the discharge of contaminants to the sewer.

Sims Matchplate Corporation
and
Sims Casting Corporation
2174 East Erie Boulevard
Syracuse, New York

MANUFACTURING PROCESSES

Sims Matchplate, the parent corporation, produces metal pattern equipment for foundries. Much of the pattern production is used by Sims Casting in making the plaster molds in which aluminum castings are made. Sims Matchplate has 25 employees while Sims Casting has 130 employees. Both plants are in operation 8 hours per day, 5.5 days per week.

WASTEWATER PRODUCTION AND TREATMENT

No wastewater results from production operations at Sims Matchplate. The total water usage of 325 gallons per day is used for sanitary purposes and is discharged via the sanitary sewer to the Ley Creek Sewerage System.

At Sims Casting, wastewater is produced in Buildings Nos. 3 and 5 when plaster is washed from castings. Although the great majority of plaster is removed in a dry operation, a significant amount of plaster is discharged with the rinse water to sumps. The mixture of water and plaster is pumped from the sumps into tank trucks and hauled to a disposal site at least 5 or 6 times per week. Very little overflow enters the sewers as the sumps are watched very closely.

According to Sims Casting plant records, total water usage at Buildings Nos. 3 and 5 is 750 and 125 gallons per day, respectively. Considering sanitary usage as well as casting washwater, this value appears to be somewhat low.

In the summer, compressor cooling water is pumped to the roof over the casting operation to aid in keeping the building cool.

Sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.
2. Continue current method of casting washwater collection and disposal.

Spaulding Metal Co., Inc.
and
Safeguide Cutter Co.
109 Baker Street
Syracuse, New York

MANUFACTURING PROCESSES

Spaulding Metal Co., Inc., and Safeguide Cutter Co., are owned and operated jointly. The former is a non-ferrous, tin-dipping operation, while the latter assembles paper cutting equipment. A total of four persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Safeguide Cutter Company is a completely dry operation, and the only wastewater is sanitary in origin.

Metal parts received by Spaulding Metal Company are cleaned in hydrochloric acid, dipped in molten tin, and then in water quenching tanks. Approximately once a month the contents of the 30-gallon hydrochloric acid tank, 30-gallon caustic tank, and 30-gallon water quench tank are mixed and dumped to the sewer.

Of the approximate 50 gallons per day water usage in these two companies, an estimated 40 gallons is sanitary in origin. Sanitary wastewaters from both companies are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

The wastewater problem at this plant consists of small (less than 100 gallons per month) discharges of acid and caustic.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System. Care should be taken that the pH of the mixed acid and caustic batch dumps be adjusted between 5.5 and 9.0.

Steps and Rails, Inc.
3201 Erie Boulevard, East
Syracuse, New York

MANUFACTURING PROCESSES

Steps and Rails, Inc., (formerly Cashier Translucent Awning Corp.) fabricates aluminum and fiberglass awnings. Presently, 14 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Since manufacturing operations are essentially "dry", no process wastewater is generated. A small amount of oil is used to cool the machines. All scrap material is dry-cleaned prior to being hauled to land disposal.

An estimated 140 gallons of water are used per day for sanitary purposes. As there are no sewers in this area, it is believed that the sanitary wastewater is discharged to a septic tank system.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Determine whether sanitary sewage is being discharged to a septic tank or to the Ley Creek Sewerage System. If discharged to a septic tank, this procedure should continue as long as it is adequate and appropriate. If wastewater is discharged to the Ley Creek Sewerage System, continue to do so.

W. H. Stewart, Inc.
202 Kratz Avenue
Syracuse, New York

MANUFACTURING PROCESSES

W. H. Stewart, Inc., assembles and paints sewer cleaning equipment from parts manufactured at other locations. At present, 21 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated during equipment assembly. A water scrubbing system is not used in the paint spray booth. The paint is vacuumed through a filter system for removal.

An estimated 210 gallons of sanitary wastewater per day are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Stickley Manufacturing Company
2904 Burnet Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Stickley Manufacturing Company manufactures wooden furniture and presently employs 18 persons. In the late summer of 1968, the company is moving to Fayetteville, New York, which is outside the Ley Creek drainage area.

WASTEWATER PRODUCTION AND TREATMENT

Because the furniture-making is a "dry" process, the only wastewater generated is an estimated 180 gallons per day from sanitary sources. The sanitary wastewater is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

B. G. Sulzle, Inc.
1001 East Hiawatha Boulevard
Syracuse, New York

MANUFACTURING PROCESSES

B. G. Sulzle, Inc., manufactures various sizes and shapes of surgical needles. Cold rolled steel wires are cut to the appropriate size, drilled, heat treated, and shipped to pharmaceutical companies. Information regarding the number of employees was not given, but according to the Manufacturers' Association of Syracuse, the company employs between 50 and 200 persons.

Note: The company moved from the indicated location during the summer of 1968. The location of the new facilities was not known; however, it was thought to be in the Ley Creek Sewerage District.

WASTEWATER PRODUCTION AND TREATMENT

B. G. Sulzle's management was not amenable to a plant visit; therefore, the information presented was obtained from a company representative. Since this type of industry is not thought to discharge significant amounts of contaminants, a plant visit was not considered essential.

The company representative stated that no process wastewaters are generated. Approximately 20,000 gallons of water per day are used in sanitary facilities, for the once-through air conditioner (80 ton) cooling water, a large boiler, and for sprinkling the plant roof for temperature control during the summer.

Sanitary wastewater and cooling waters were assumed to be discharged from the old facilities to the Ley Creek Sewage Treatment Plant. In the new facilities, contaminated wastewaters should be discharged in compliance with Onondaga Countys' "Rules and Regulations Governing the Use of Public Sewers," to the local treatment system. Clean cooling waters should be discharged to a storm sewer system.

SAMPLING AND ANALYSIS PROGRAM

The wastewater was not sampled.

CONCLUSIONS

Based upon the information obtained from plant personnel, there was no apparent industrial wastewater problem.

RECOMMENDATIONS

1. Discharge contaminated wastewaters, complying with previously established limits, to an acceptable treatment system.
2. Segregate all uncontaminated wastewaters for disposal to a storm sewer system.

Super Heat Treating, Inc.
P. O. Box 174
3605½ James Street
Syracuse, New York

MANUFACTURING PROCESSES

Super Heat Treating, Inc., heat treats metal on a "job shop" basis. After heating, the metal product is quenched in oil, water, or air, and, on rare occasions, in a cyanide salt. At present, 13 persons are employed for one shift per day, 6 days per week.

WASTEWATER PRODUCTION AND TREATMENT

Approximately 56,000 gallons per day of relatively uncontaminated cooling and quenching water are discharged at the rear of the building and allowed to drain into the ground. Plant personnel have indicated that cooling towers will be erected within the year so that the water can be reused.

Heat exchangers are used to cool the quenching oil. When the oil is spent, it is removed by a scavenger.

An estimated 130 gallons per day of sanitary wastewater are discharged to a septic tank system.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no significant industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the septic tank as long as it is adequate and appropriate.
2. Construct cooling towers to permit reuse of the large volume of water currently discharged to the ground.

Swenton Tool and Die Co.
5992 Court Street Road
Syracuse, New York

MANUFACTURING PROCESSES

Swenton Tool and Die Company is a precision metal working shop. Parts are ground to specifications for use as tools and dies. Operations include drilling, sawing, welding, and bending. Nine persons are employed on a one shift per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Cooling water for a 10-HP air compressor, which is operated infrequently, is discharged to the sewer. Two grinding machines also utilize water as a base for grinding oil emulsions. All of the oil emulsion fluid is recirculated through a bag filter to remove ground metal. If there is any wastewater discharge from this source, it is very infrequent (3-6 months), and the maximum amount would only be five to ten gallons of a 10 percent oil emulsion.

An estimated 100 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Syracuse Brick Corp.
6060 Court Street
Syracuse, New York

MANUFACTURING PROCESSES

Syracuse Brick Corp. is a marketing operation for various building materials. Since no process wastewater is generated, a visit was not made.

WASTEWATER PRODUCTION AND TREATMENT

Sanitary wastewater is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Syracuse China Corporation
Division of Onondaga Pottery Company
2900 Court Street
Syracuse, New York

MANUFACTURING PROCESSES

Syracuse China Corporation is one of the world's largest producers of institutional china. Production processes include mixing the clay and water, pressing the mixture to remove the excess water, extruding the mixture, forming the china pieces, and baking the mold. Then, the china is decorated, fired in a final curing operation, ground, and packaged.

At the Court Street Plant, approximately 1,200 people are employed, with 1,100 on the first shift and 100 on the second shift. The plant normally operates for 13 hours per day, five days per week.

WASTEWATER PRODUCTION AND TREATMENT

The primary sources of process wastewater and contamination are the pressing and plant clean-up operations. These wastewaters, as well as cooling water for the four vacuum pumps and the unreturned boiler condensate, are discharged via a drainage ditch, wholly contained on company property, to Ley Creek.

According to company records, total water usage is 200,000 gallons per day. Of this, approximately 36,000 gallons per day are used for sanitary purposes. The balance is used in the product and for rinsing and cooling. Segregated sanitary sewage is discharged through a separate sewer to the Ley Creek Sewage Treatment Plant System.

SAMPLING AND ANALYSIS SURVEY

Composite wastewater samples were taken at a location in the drainage ditch where process wastewaters from all areas of the plant were present. To determine the quality and quantity of the wastewaters entering Ley Creek, the composite samples were analyzed for pH, chemical oxygen demand (COD), suspended solids (SS), total solids (TS), volatile suspended solids (VSS), and alkalinity/acidity.

Total effluent flow was estimated from the water meter readings which show the volume of the influent flow pumped to the plant water tower. To confirm the data, the lithium dilution technique for measuring effluent flow was attempted. However, because of mixing problems, the flow data did not appear as reliable as that obtained by reading the meter and thus was not used.

Raw data obtained during the sampling and analysis survey are given in Table SC-1, with the data extended to pounds per day shown in Table SC-2.

DISCUSSION

Analyses of the samples taken during the survey indicated suspended solids are the pollutant of concern. The COD and the VSS analyses confirmed that the vast majority of these solids are inorganic. Based on survey data, an average of about 3,000 pounds of suspended solids are discharged each 24-hour period. A maximum discharge rate of about 9,000 pounds per day was observed over a 6.3-hour period.

CONCLUSIONS

Based on information obtained during on-site inspection and the analytical data, suspended solids concentrations in the process wastewaters are excessive for discharge directly to Ley Creek.

RECOMMENDATIONS

Implement in-plant operating changes, abatement measures, and/or on-site treatment, if necessary, to reduce the suspended solids loading in the effluent to acceptable limits for discharge to Ley Creek or to the Ley Creek Sewerage System.

SYRACUSE CHINA CORPORATION
SYRACUSE, NEW YORK

TABLE SC-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

INDUSTRIAL WASTEWATER DISCHARGE

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	VSS	TS
091	07 02 68	1000	grab	0.000*	19	7.6	24	0	1424	162	3826
089	07 02 68	1645	6.7	0.392	39	7.4	20	0	930	60	1788
090	07 03 68	0815	15.5	0.168	10	7.9	36	0	70	0	1182
094	07 09 68	0855	16.2	0.180	19	7.4	10	0	530	16	1750
101	07 09 68	1645	7.8	0.361	19	5.8	0	30	1260	90	0*
111	07 10 68	1445	22.0	0.259	30	6.0	0	10	788	58	1495
117	07 11 68	0830	17.7	0.181	10	6.0	0	16	426	14	1530
122	07 11 68	1450	6.3	0.401	60	6.0	0	60	2770	168	3685
127	07 12 68	0900	18.2	0.197	0	6.8	0	2	348	12	1430
130	07 12 68	1525	6.4	0.384	29	6.8	0	2	1792	104	3595

TABLE SC-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

INDUSTRIAL WASTEWATER DISCHARG

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	VSS	TS
091	07 02 68	1000	0.000*	0*	7.6	0*	0*	0*	0*	0*
089	07 02 68	1645	0.392	127	7.4	65	0	3037	196	5838
090	07 03 68	0815	0.168	14	7.9	50	0	98	0	1654
094	07 09 68	0855	0.180	28	7.4	15	0	795	24	2624
101	07 09 68	1645	0.361	57	5.8	0	90	3789	271	0*
111	07 10 68	1445	0.259	65	6.0	0	22	1700	125	3225
117	07 11 68	0830	0.181	15	6.0	0	24	642	21	2307
122	07 11 68	1450	0.401	200	6.0	0	200	9253	561	12309
127	07 12 68	0900	0.197	0	6.8	0	3	571	20	2347
130	07 12 68	1525	0.384	93	6.8	0	6	5732	333	11499

*=NO ANALYSIS

Syracuse Concrete Pipe and Products Corp.
Burnet Avenue and Clark Street
East Syracuse, New York

MANUFACTURING PROCESSES

Syracuse Concrete Pipe and Products Corp. manufactures pre-stressed and regular concrete pipe. In a batch operation, sand, crushed stone, cement, and water are mixed and poured into molds, forming concrete pipes. The sand and crushed stone are pre-washed by the supplier. At present, 35 persons are employed on a one shift per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Approximately 30,000 gallons per day of water are purchased but almost all of this is used in the product. The daily washing of concrete forms is the only source of process wastewater. An estimated 5,000 gpd of washwater plus any stormwater runoff are discharged to a nearby creek via a catch basin. Water also is used in boilers to generate steam needed to cure the concrete pipes. Spoiled batches and test samples, together with concrete collected in the catch basin, are disposed of to landfill.

Sanitary wastewater, estimated at 350 gpd, is discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.
2. Continue to discharge washwater and stormwater runoff to the creek as long as the catch basin is properly maintained.

Syracuse Die Casting and Manufacturing Company
2101 Teall Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Syracuse Die Casting and Manufacturing Company manufactures small aluminum castings. Currently, eight persons are employed on a 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Most of the approximately 3,000 gallons per day of water purchased is used as cooling water for the die casting machines. The remainder, estimated at 80 gallons per day, is of sanitary origin. The "clean" cooling water and sanitary wastewater are discharged to the Ley Creek Sewerage System. The floor is dry swept so that a minimum of oil enters the sewers through floor drains. Oil used in production processes is collected, placed in barrels, and hauled to a disposal site.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Syracuse Gauge Co., Inc.
113 South Midler Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Syracuse Gauge Co., Inc., assembles prefinished parts into various types of pressure gauges. Currently, twelve persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The only process using water is the tumble-washing of plastic parts in soap and water. An estimated 160 gallons per day of washwater and sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Syracuse Old Fashion Beverages
2001 Lemoyne Avenue
Syracuse, New York

MANUFACTURING PROCESSES

Syracuse Old Fashion Beverages is a soft-drink bottling company. About 5,000 cases of Royal Crown Cola, Diet Rite Cola, Mom's Old Fashion Root Beer and other soft drinks are bottled each week. In addition to bottling, unit processes include bottle washing and syrup preparation. Seven persons, working one shift per day, 5 days per week, are employed. However, soft drinks are only bottled 4 days a week.

WASTEWATER PRODUCTION AND TREATMENT

Returnable bottles are washed and rinsed in an automated machine to which detergents have been added. After use, the washwater is discharged to the sewer. Straws and other material removed from the bottles are hauled to a dump. Plant water usage approximates 11,200 gallons per day. The majority of the water purchased is used in bottling of soft drinks. This water is pretreated with lime, copperas and chlorine before settling and filtration. Before bottling, the treated water is dechlorinated. Filter backwash solids are discharged to the sewer. Syrup is made in a batch tank by the addition of raw syrup and sugar water. The syrup is then pumped to the bottling operation. Contaminants reach the sewer from the general clean-ups, leaks and spills. Bottling equipment and production areas also contribute contaminants during clean-ups. The washwater is discharged through the floor drains to the sewer. Trucks are washed on the plant site, but the water is discharged to the ground.

Less than 100 gallons per day of sanitary wastewater are discharged to the Ley Creek Sanitary System.

CONCLUSIONS

A relatively low volume of wastewater containing organic contamination is discharged to the Ley Creek Sewerage System. This contamination is compatible with biological treatment; however, the concentration of organic contaminants may on occasion exceed allowable discharge limits set forth in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Syracuse Pharmacal Co., Inc.
Falso Drive
Mattydale, New York

MANUFACTURING PROCESSES

Syracuse Pharmacal Co., Inc., blends and packages pharamaceuticals for the veterinary profession. No chemical processing is performed at the plant. At present, seven persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Process wastewater is limited to approximately 70 gallons per day, resulting from washing reagent bottles, tubs, and mixers. The washwaters and an estimated 70 gpd of sanitary wastewater are discharged to a septic tank system.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the septic tank system as long as it is adequate and appropriate.

Syracuse Ready Mix Co.
Burnet Avenue and Clark Street
East Syracuse, New York

MANUFACTURING PROCESSES

Syracuse Ready Mix Co. produces ready-mix concrete. The sand used in production of the product is washed at the company's new plant in East Manlius. The East Syracuse operation employs 15 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No industrial wastewater is discharged to the sewer. Of the total 3,000 gallons of water used each day, approximately 1,900 gallons are used in the product mix. Water for sanitary facilities would account for 10 to 20 percent of the remaining 1,100 gallons, whereas the balance is probably discharged to the ground as a result of truck washings.

A source of wastewater would be stormwater runoff which is washed into the drains located in the loading yard. It is assumed that these drains are connected to the storm sewer. Since the transit mix truck and the cement mixer are washed daily in the loading area, the washwaters discharged to the ground could enter the sewer during periods of heavy rain.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no significant industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewaters described above to the Ley Creek Sewerage System.

Syracuse Mid State Spring, Inc.
3530 Erie Boulevard East
DeWitt, New York

MANUFACTURING PROCESSES

Syracuse Mid State Spring, Inc., manufactures coil springs. The company employs 13 persons on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The operation is dry, and there are no floor drains.

An estimated 200 gallons per day of wastewater, all sanitary in origin, are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the Ley Creek Sewerage System.

Temple Farms Dairy, Inc.
410 North Midler Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Temple Farms Dairy, Inc., processes and bottles raw milk. It is a comparatively small operation, bottling approximately 1,500 quarts of milk per week.

WASTEWATER PRODUCTION AND TREATMENT

Process wastewater is generated from bottle washing, milk can washing, floor washing, and equipment cleanup operations. Both process and sanitary wastewater, approximately 4,000 gallons per day, are discharged to the Ley Creek Sewerage System. Although high organic contamination concentrations would be expected, total pollutional loading should not be excessive.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

Organic contamination discharged from this location should be compatible with biological treatment. The concentration of contaminants may occasionally exceed the allowable discharge limits set forth in the Onondaga County "Rules and Regulations Governing the Use of Public Sewers."

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Thomas Foundry, Inc.
Lamson Street
Syracuse, New York

MANUFACTURING PROCESSES

Thomas Foundry, Inc., is an aluminum and bronze foundry which operates on a "job shop" basis. Currently, nine persons are employed on a 8-hour day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

The majority of the 1,000 gallons per day water purchased is used to moisten sand. None of the water reaches the sewer. An estimated 90 gallons per day of sanitary wastewaters are discharged to a septic tank on plant property.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the septic tank as long as this system is adequate and appropriate.

Thor Metal Products
5894 East Molloy Road
Syracuse, New York

MANUFACTURING PROCESSES

Thor Metal Products fabricates sheet metal into heating supplies. Currently, fifty-five persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Of the 2,000 gallons per day water usage, an estimated 550 gallons are sanitary in origin and are discharged to the Ley Creek Sewerage System. The remaining volume is once-through cooling water for air compressors. It also is discharged to the sewer.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial wastewater disposal problem.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.
2. Discharge clean uncontaminated cooling waters to a storm sewer system.

Titan Box Company
Buckley Road
Liverpool, New York

MANUFACTURING PROCESSES

Titan Box Company manufactures wooden boxes, a "dry" operation. Currently, 38 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

An estimated 380 gpd of sanitary wastewater are discharged to a septic tank. Sawdust from the lumber-cutting operation is burned.

Note: This industry was subsequently found to be outside the Ley Creek Sanitary District.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewater to the septic tank as long as it is adequate and appropriate.

Linde Division
Union Carbide Corp.
Boxwood Lane, Midler Park
Syracuse, New York

MANUFACTURING PROCESSES

The Linde Division of Union Carbide produces various industrial gases. Currently, 23 persons are employed on the first shift and 2 persons on the second shift. Normally, the work week is 5 days.

WASTEWATER PRODUCTION AND TREATMENT

Calcium carbide and water are added to a reaction vessel for the production of Acetylene and a calcium hydroxide solution. The Acetylene is bottled into small cylinders. About 8,000 gallons per day of cooling water are used to cool the gas transfer pumps and the bottled gas itself. All clean cooling water is discharged to the Ley Creek Sewerage System. The calcium hydroxide solution (approximately 10,000 gallons per day) is discharged to a sump and then transferred to a large settling pond. According to Linde personnel, this pond will hold approximately five years' production of the calcium hydroxide by-product solution. Lime is allowed to settle out, and the liquid either evaporates or percolates into the soil. When the pond becomes full, the overflow will discharge to Ley Creek. Stormwater is discharged to Ley Creek.

An estimated 250 gallons per day of sanitary wastewater are discharged to the sewer.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

1. There is no apparent industrial waste disposal problem at this time.
2. Disposal of the cooling water to the sanitary sewer should be discontinued.

RECOMMENDATIONS

1. Continue to discharge sanitary wastewaters described above to the Ley Creek Sewerage System.
2. Divert clean cooling waters to Ley Creek.
3. Obtain an alternate disposal means for calcium hydroxide disposal when present facilities become inadequate.

Valcar Sheet Metal Corp.
Pickard Drive
Mattydale, New York

MANUFACTURING PROCESSES

Valcar Sheet Metal Corp. fabricates air ducts on a "job-shop" basis. At present, 42 persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Approximately 1,000 gallons per day of water are used as cooling water for the two arc welders. This water is not recycled but is dumped on the ground outside the building. Another 700 gallons per day of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to dispose of cooling wastewaters in the current manner as long as it is adequate and appropriate.
2. Continue to discharge sanitary wastewaters to the Ley Creek Sewerage System.

VanSanford Tool Corporation
4411 James Street
East Syracuse, New York

MANUFACTURING PROCESSES

VanSanford Tool Corporation is a tool and die shop operation, employing 15 persons on a 9-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Cooling water, used on a once-through basis for shaper and air conditioning systems, is discharged to storm sewers which flow directly to Ley Creek. Oil, the only possible pollutant in the operation, is used in the grinder lubricating system. It is recirculated and seldom dumped. Of the 280 gpd water usage, approximately 195 gpd are sanitary in origin and are discharged to the Ley Creek Sewerage System. Management investigated the possibility of recirculating cooling water but found it would be uneconomical.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

1. Continue to dispose of "clean" cooling water and sanitary wastewater in the above-described manner.
2. Dispose of the oil from the grinder lubricating system to a scavenger or in some other approved manner.

Walker Corp. & Co., Inc.
North Collingwood Avenue and East Hampton Place
Syracuse, New York

MANUFACTURING PROCESSES

The Walker Corp. & Co., Inc., is a pharmaceutical company, manufacturing patent medicine. Twenty persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

Of the 600 gallons per day water usage, about 200 gallons are process wastewater generated during clean-up of batch mixers, spills, etc. The balance of 400 gallons per day is used for sanitary purposes. All wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no significant industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge wastewaters described above to the Ley Creek Sewerage System.

Wholesale Cooperative Meat Dealers, Inc.
325 West Second Street
Syracuse, New York

MANUFACTURING PROCESSES

Wholesale Cooperative Meat Dealers, Inc., is a slaughterhouse. Four persons are employed on an 8-hour per day, 5-day per week basis.

Note: Subsequent conversations with Wholesale Cooperative personnel indicated that production was to be completely halted. Part of the facility had been appropriated for highway construction and no plans were revealed for possible relocation.

WASTEWATER PRODUCTION AND TREATMENT

At the time of the preliminary visit (April 1968), an estimated 37,000 pounds of cattle and 12,000 pounds of calves were slaughtered per week. The animal is stunned, bled, gutted, skinned, washed, and the meat refrigerated. The blood and washwater are discharged directly to the sewer. The paunch manure is collected, dried and hauled to land disposal. Edible and inedible materials are saved and sold to a rendering manufacturer. The entire plant area is drained to an effluent sump, but a screen has been placed over the effluent sewer line to prevent discharge of solids. When the sump is filled, it is manually cleaned and solids are hauled to landfill.

An average of 25,000 gallons of water are used per day. However, every effort is made to conserve water and all washing operations are manually controlled with an automatic shut-off valve on the end of the hose.

An estimated 40 gallons per day of sanitary wastewaters are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

Since Wholesale Cooperative is expected to go out of business, there is no need for further wastewater investigation.

RECOMMENDATIONS

In the event that Wholesale Cooperative resumes operations at a location within the Ley Creek drainage area, close attention should be paid to wastewater management. Waste handling procedures should be approved by Onondaga County Division of Drainage and Sanitation prior to construction.

The Wickhardt Company, Inc.
2704 Erie Boulevard East
Syracuse, New York

MANUFACTURING PROCESSES

The Wickhardt Company, Inc., manufactures plastic lamination and machine engravings and currently employs 12 persons on the first shift and two persons on the second shift.

WASTEWATER PRODUCTION AND TREATMENT

The only process wastewater generated is cooling water used during the lamination operation. The cooling water plus an estimated 140 gallons per day sanitary wastewater are discharged to a septic tank system. Total water use is estimated at 500 gallons per day.

Solid waste is hauled to a dump site for disposal.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to dispose of above-described wastewaters to the septic tank system as long as it is adequate and appropriate.

Will and Baumer Candle Co., Inc.
Park Street North and Liverpool Road
Syracuse, New York

MANUFACTURING PROCESSES

The Will and Baumer Candle Co., Inc., manufactures candles and slab wax using beeswax, paraffin, and stearic acid as raw materials. The three major manufacturing processes were designated by Will and Baumer as beeswax refining, melting, and vassar production. The company has 220 employees and works 5 days per week, 9 hours per day.

In the beeswax refining process, the raw contaminated beeswax is heated with steam, liquid wax is separated by gravity, and the wax subsequently bleached. The bleached liquid wax is then poured into pans (panning) and cooled to form slabs of solidified wax.

The melting department refines scrap wax from the refining operation and also melts and blends paraffin, beeswax and stearic acid with subsequent panning of the blended product.

The vassar production department manufactures candles using commercial liquid wax. Unit processes include dipping, cutting, and packaging. Beeswax products include religious candles.

WASTEWATER PRODUCTION AND TREATMENT

Primary sources of wastewater are the clarification and bleaching processes. All water and spent chemicals from the beeswax refining process are segregated and discharged to the plant grounds, or approximately 1,000 gallons per day on a single batch basis. Wastewaters from the melting department are placed in a sump, where the floatable materials are collected and removed to landfill or burnt. The subnatant is discharged to Onondaga Lake. Cooling water, the only process wastewater from vassar production, also is discharged via the sewer to the lake.

Will and Baumer estimated that 400,000-600,000 gallons are used each day as saline cooling water. Although the majority of this water is obtained from wells on the premises, approximately 20,000 gallons per working day are purchased from public sources.

Sanitary wastewater, estimated at 2,200 gpd, is segregated and discharged to the Ley Creek Sewage Treatment Plant.

SAMPLING AND ANALYSIS SURVEY

During the period from July 17 to July 19, 1968, composite samples of wastewaters being discharged to Onondaga Lake were collected. The sample collection point was a brick-lined manhole in the parking lot median opposite the receiving department loading dock. Some composite samples were taken during the production shift, while others were obtained during off-hours. Average flow rates over the sample periods were determined by the lithium dilution technique. A known rate of a standardized lithium chloride solution was added continuously at a manhole adjacent to the cooling water sump just outside the main candle plant loading dock. Based on the lithium concentration collected downstream in the composite sample, the average flow rate was calculated over the compositing period.

Results of the sampling and analysis survey are presented in Table WB-1. Pollutant loadings expressed in pounds/day are presented in Table WB-2. There was no significant difference in wastewater contaminants levels measured during production and non-production shifts. Flow during non-production shifts was approximately 20 percent less than during the production shift. The concentrations of organic pollutants, as measured by the COD test, were generally less than 100 mg/L. Concentrations of total solids were relatively high, ranging from 3,000 mg/L to 3,300 mg/L. The flow averaged 420,000 gallons per day. The large volume of saline cooling water should be relatively free of organic contamination. Therefore,it is reasonable to assume that a smaller volume of process wastewater is the main source of organics. These organics should not be discharged to Onondaga Lake. Total solids concentration in the effluent is similar to the concentration in Onondaga Lake.

CONCLUSIONS

A significant wastewater flow, high in dissolved solids and relatively low in organic pollution, is discharged. Although dissolved solids content is high, reflecting the use of saline cooling water, the general level is approximately the same as that presently found in Onondaga Lake.

RECOMMENDATIONS

Based on the results of the in-plant visit and the sampling and analysis survey, the following recommendations are made:

1. Investigate the feasibility of placing all cooling waters in recirculating systems.
2. Segregate all process wastewater containing organic pollution that are currently being discharged to Onondaga Lake from clean or saline cooling waters, and discharge these process waters to the sanitary sewer.
3. Continue to discharge wax refining wastes to the plant grounds as long as this method of disposal is adequate and appropriate.

WILL AND BAUMER CANDLE CO., INC.
SYRACUSE, NEW YORK

TABLE WB-1

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

WASTEWATER DISCHARGE

ID	DATE	TIME	SAMPLING TIME HOURS	FLOW	COD	PH	ALKAL	ACID	SS	TS
152	07 17 68	0745	14.0	0.331	87	7.6	35	0	10	3255
160	07 17 68	1645	9.0	0.419	77	6.7	0	5	4	0*
162	07 18 68	0815	15.5	0.432'	86	6.9	0	2	26	3051
168	07 18 68	1630	4.0'	0.540	29	6.3	0	8	14	3010
172	07 19 68	0900	15.5	0.387	68	6.8	0	3	4	3316
175	07 19 68	1540	6.6	0.420	112	6.4	0	5	20	3022

TABLE WB-2

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

WASTEWATER DISCHARGE

ID	DATE	TIME	FLOW	COD	PH	ALKAL	ACID	SS	TS
152	07 17 68	0745	0.331	240	7.6	97	0	28	8980
160	07 17 68	1645	0.419	269	6.7	0	17	14	0*
162	07 18 68	0815	0.432'	309	6.9	0	7	94	10979
168	07 18 68	1630	0.540	130	6.3	0	36	63	13540
172	07 19 68	0900	0.387	219	6.8	0	10	13	10700
175	07 19 68	1540	0.420	392	6.4	0	18	70	10585

*=NO ANALYSIS
'ESTIMATED

Wood Preserving Co., Inc.
401 North Midler Avenue
Syracuse, New York

MANUFACTURING PROCESSES

The Wood Preserving Co., Inc., is a lumber-treating operation, employing one person.

WASTEWATER PRODUCTION AND TREATMENT

In the lumber-treating operation, pentachlorophenol is mixed with oil, pumped into a lumber-filled reaction vessel, and steam is injected into the vessel to raise the temperature. The system is then placed under high pressure to facilitate saturationof the lumber. When the lumber is removed from the reaction vessel, excess oil, water, and pentachlorophenol flow to a separation tank. The water layer (approximately 10-20 gallons) from the separation tank is allowed to drain to the sewer; the oil and pentachlorophenol mixture are pumped to a holding tank and reused in subsequent batches. This process is repeated on the average of 2-3 times per day. According to the Wood Preserving Co., none of this oil and pentachlorophenol mixture is discharged to the sewer, except possibly a small amount (less than 5 gallons) at the end of the water layer. The total pounds of contaminants discharged should be minimal; however, the potential exists during an abnormal condition (tank failure) for discharging significant quantities of contaminants to the sewer.

An estimated 10 gpd of sanitary wastewater are discharged to the Ley Creek Sewerage System.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no significant industrial waste disposal problem although a low order of phenols and organics are discharged.

RECOMMENDATIONS

1. Continue to discharge the small quantities of sanitary and process wastewaters to the Ley Creek Sewerage System.
2. Install safeguards to prevent the accidental discharge of large volumes of contaminated wastewaters or chemicals.

Young & Franklin Tool Works, Inc.
Liverpool Road
Liverpool, New York

MANUFACTURING PROCESSES

Young & Franklin Tool Works, Inc., manufactures tools and dies by machining metal and currently employs 60 persons on an 8-hour per day, 6-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

During winter months, approximately 640 gallons per day of sanitary wastewater are generated and discharged to the sewer. In the summertime, an additional 560 to 600 gallons per day of water are used as cooling water for the air-conditioning system. No process wastewater is generated.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge the above-described wastewater to the Ley Creek Sewerage System.

H. C. Young Tool and Machine Co., Inc.
3700 New Court Avenue
Syracuse, New York

MANUFACTURING PROCESSES

H. C. Young Tool and Machine Co., Inc., is a small tool and machine shop operating on a "job-shop" basis. Three persons are employed on an 8-hour per day, 5-day per week basis.

WASTEWATER PRODUCTION AND TREATMENT

No process wastewater is generated, and sanitary wastewaters are discharged to the Ley Creek Sewerage System. It was calculated from water bills that roughly 750 gallons of water per each three month period are used.

SAMPLING AND ANALYSIS SURVEY

The wastewater was not sampled.

CONCLUSIONS

There is no industrial waste disposal problem.

RECOMMENDATIONS

Continue to discharge sanitary wastewaters to the Ley Creek Sewage Treatment Plant.

APPENDIX B

APPENDIX C

The following rules and regulations are hereby promulgated by the Commissioner of Public Works pursuant to sections 11.53g and 11.53j of Article 11A of the Onondaga County Administrative Code

Rules & Regulations Governing

the Use of Public Sewers

Section 1. No person shall discharge or cause to be discharged any storm water, surface water, ground water, roof runoff, subsurface drainage, cooling water or unpolluted industrial process waters to any sanitary sewer.

Section 2. Storm water and all other unpolluted drainage shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers, or to a natural outlet approved by the Commissioner. Industrial cooling water or unpolluted process waters may be discharged, upon approval of the Commissioner, to a storm sewer, combined sewer or natural outlet.

Section 3. Except as hereinafter provided, no person shall discharge or cause to be discharged any of the following described waters or wastes to any public sewer:

a) Any liquid or vapor having a temperature higher than (150° F.).
b) Any water or waste which may contain more than (100) parts per million, by weight, of fat, oil, or grease.
c) Any gasoline, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid or gas.
d) Any garbage that has not been properly shredded.
e) Any ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch manure, or any other solid or viscous substance capable of causing obstruction to the flow in sewers or other interference with the proper operation of the sewage works.
f) Any waters or wastes having a pH lower than (5.5) or higher than (9.0), or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the sewage works.
g) Any waters or wastes containing a toxic or poisonous or radioactive substance in sufficient quantity to injur or interfere with any sewage treatment process, constitute a hazard to humans or animals, or create any hazard in the receiving waters of the sewage treatment plant.
h) Any waters or wastes containing suspended solids of such character and quantity that unusual attentio n or expense is required to handle such materials at the sewage treatment plant.
i) Any noxious or malodorous gas or substance capable of creating a public nuisance.

Section 4. Grease, oil, and sand interceptors shall be provided when, in the opinion of the Commissioner, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, and other harmful ingredients; except that such interceptors shall not be required for private living quarters or dwelling units. All interceptors shall be of a type and capacity approved by the Commissioner, and shall be located as to be readily and easily accessible for cleaning and inspection.

Grease and oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight, and equipped with easily removable covers which when bolted in place shall be gastight and watertight.

Section 5. Where installed, all grease, oil and sand interceptors shall be maintained by the owner, at his expense, in continuously efficient operation at all times.

Section 6. The admission into the public sewers of any waters or wastes having (a) a 5-day Biochemical Oxygen Demand greater than (300) parts per million by weight, or (b) containing more than (350) parts per million by weight of suspended solids, or (c) containing any quantity of substances having the characteristics described in Section 3, or (d) having an average daily flow greater than (2%) of the average daily sewage flow of the receiving treatment plant, shall be subject to the review and approval of the Commissioner. Where necessary in the opinion of the Commissioner, the owner shall provide, at his expense, such preliminary treatment as may be necessary to, (a) reduce the Biochemical Oxygen Demand to (300) parts per million and the suspended solids to (350) parts per million by weight, or (b) reduce objectionable characteristics or constituents to within the maximum limits provided for in Section 3, or (c) control the quantities and rates of discharge of such waters or wastes. Plans, specifications, and any other pertinent information relating to proposed preliminary treatment facilities shall be submitted for the approval of the Commissioner and no construction of such facilities shall be commenced until said approval is obtained in writing.

Section 7. Where preliminary treatment facilities are provided for any waters or wastes, they shall be maintained continously in satisfactory and effective operation, by the owner at his expense.

Section 8. When required by the Commissioner, the owner of any property served by a building sewer carrying industrial wastes shall install a suitable control manhole in the building sewer to facilitate observation, sampling and measurement of the wastes. Such manhole, when required, shall be accessibly and safely located, and shall be constructed in accordance with plans approved by the Commissioner. The manhole shall be installed by the owner at his expense, and shall be maintained by him so as to be safe and accessible at all times.

Section 9. All measurements, tests, and analyses of the characteristics of waters and wastes to which reference is made in Sections 3 and 6 shall be determined in accordance with "Standard Methods for the Examination of Water and Wastewater, and shall be determined at the control manhole provided for in Section 8, or upon suitable samples taken at said control manhole. In the event that no special manhole has been required, the control manhole shall be considered to be the nearest downstream manhole in the public sewer to the point at which the building sewer is connected.

Section 10. No statement contained in this article shall be construed as preventing any special agreement or arrangement between the Commissioner and any industrial concern whereby an industrial waste of unusual strength or character may be accepted by the Commissioner for treatment, subject to payment therefor by the industrial concern.

Signed:

Edwin M. Baylard
Edwin M. Baylard
Commissioner of Public Works

February 28, 1968

Approved:

John H. Mulroy
John H. Mulroy
County Executive

February 28, 1968

APPENDIX D

THIS TABULATION IS THE RAW DATA FROM THE SURVEY
FLOW IS IN MILLION GALLONS PER DAY
CONCENTRATIONS ARE IN MILLIGRAMS PER LITER

RANDOM GRAB SURVEY - INFLUENT

ID	DATE	TIME	FLOW	PH	ALK	ACID	BOD-5	BOD UC	COD	SS	VSS	OIL[1]	CN-	PHENOL	TOT CR	COPPER	ZINC	CADM	NICKEL	NH3-N	ORG-N	PO4-O	PO4TOT
001	06 13 68	1500	18.8	7.4	28	0	190	212	432	276	140	70.5	0.024	0.07	0.44	0.28	0.69	0.10	0.125	9.6	26.6	25	46
002	06 13 68	2000	15.6	6.5	0	20	388	530	936	586	216	83.0	0.024	0.33	0.20	0.22	0.39	0.03	0.120	19.5	28.7	35	65
003	06 13 68	2100	15.7	6.6	0	16	260	565	696	616	320	93.0	0.010	0.06	0.34	0.12	0.70	0.15	0.150	15.7	23.0	48	70
004	06 13 68	2400	14.3	7.4	28	0	600	810	1248	1024	232	157.0	0.000*	0.20	0.27	0.35	0.68	0.05	0.115	11.9	26.0	35	50
005	06 14 68	0600	10.2	6.2	0	60	450	600	792	420	224	63.0	0.009	0.00*	0.45	0.16	0.76	0.02	0.145	26.6	38.4	180	230
006	06 14 68	0800	13.3	6.5	0	30	198	276	368	148	76	46.5	0.018	0.26	0.23	0.10	0.56	0.05	0.185	9.8	14.7	8	17
007	06 14 68	1600	18.3	6.4	0	22	372	468	720	500	320	62.0	0.160	0.11	0.39	0.50	0.74	0.10	0.150	17.8	27.8	27	65
008	06 14 68	1700	18.0	8.6	154	0	330	690	995	672	360	74.0	0.184	0.54	0.52	0.42	0.74	0.08	0.115	13.7	45.5	28	70
009	06 14 68	2300	14.2	7.0	0	0	360	552	893	252	252	139.0	0.003	0.20	0.19	0.29	0.50	0.05	0.000*	14.6	23.4	20	40
010	06 15 68	0100	13.2	6.3	0	24	432	660	838	448	268	62.5	0.003	0.31	0.15	0.39	0.58	0.10	0.000*	11.9	24.2	24	45
011	06 15 68	0400	10.2	7.0	0	0	567	816	1150	464	220	98.5	0.001	0.15	0.12	0.20	0.50	0.04	0.150	11.3	21.2	13	40
012	06 15 68	1200	15.6	7.0	0	0	288	420	597	332	224	52.5	0.092	0.15	0.15	0.25	1.41	0.04	0.045	11.0	26.3	26	93
013	06 15 68	1300	15.6	7.0	0	0	270	399	731	360	228	45.0	0.226	0.04	0.22	0.40	0.47	0.05	0.040	14.8	35.0	20	78
014	06 15 68	1600	13.3	6.0	0	60	336	477	770	256	200	53.5	0.002	0.00*	0.15	0.36	0.90	0.02	0.020	7.8	10.6	19	83
015	06 15 68	2100	15.0	6.9	0	2	1620	2010	2735	1232	360	70.0	0.001	0.13	0.15	0.40	0.90	0.03	0.000*	24.6	42.0	32	63
016	06 16 68	0200	10.5	6.7	0	6	1080	1410	2235	326	248	84.0	0.002	0.17	0.22	0.18	0.78	0.02	0.060	13.4	11.2	31	40
017	06 16 68	0700	12.8	7.1	2	0	255	288	462	80	72	24.4	0.000*	0.15	0.14	0.10	0.17	0.02	0.000*	16.5	21.8	10	15
018	06 16 68	1200	13.0	7.0	0	0	210	240	423	164	140	37.2	0.000*	0.19	0.14	0.14	0.22	0.02	0.000*	25.2	34.2	40	65
019	06 16 68	1500	13.0	8.0	60	0	444	612	904	456	336	54.2	0.000*	0.27	0.12	0.23	0.31	0.02	0.000*	13.2	31.9	28	70
020	06 16 68	1900	13.0	6.8	0	4	480	900	1230	724	336	126.0	0.000*	0.86	0.34	0.45	0.88	0.06	0.000*	16.8	27.7	33	65
021	06 16 68	2100	11.0	6.8	0	4	276	396	1000	1016	432	105.0	0.000*	0.01	0.43	0.62	1.06	0.09	0.000*	18.5	29.4	38	85
022	06 17 68	0300	8.7	8.8	130	0	696	768	1194	852	232	93.5	0.000*	0.15	0.15	0.16	0.25	0.03	0.000*	12.6	21.8	20	45
023	06 17 68	0800	9.7	7.0	0	0	648	864	1079	2232	1312	144.0	0.000*	0.01	0.20	0.21	0.44	0.02	0.000*	15.4	22.4	9	22
024	06 17 68	1000	17.3	7.1	2	0	177	270	500	456	180	64.5	0.000*	0.19	0.27	0.39	0.78	0.04	0.000*	18.5	26.8	15	65
025	06 17 68	1300	17.3	7.0	0	0	396	528	800	468	264	142.0	0.001	0.47	1.38	0.50	0.88	0.08	0.265	15.7	20.9	20	45
026	06 17 68	1900	15.7	7.0	0	0	510	696	1030	516	260	103.0	0.001	0.61	0.57	0.41	1.10	0.31	0.080	15.1	23.9	25	35
027	06 17 68	2200	15.0	7.0	0	0	342	417	800	376	216	103.0	0.001	0.24	0.36	0.26	0.74	0.06	0.190	10.4	33.1	36	70
028	06 18 68	0200	10.4	6.8	0	4	738	864	1220	420	164	95.5	0.001	0.16	0.22	0.14	1.30	0.02	0.175	10.7	18.2	15	25
029	06 18 68	0700	9.6	8.0	62	0	192	249	329	20	0*	41.5	0.002	0.30	0.14	0.14	0.42	0.02	0.135	22.4	25.2	10	15
030	06 18 68	0900	12.3	7.4	28	0	684	912	1065	312	124	66.0	0.000*	0.12	0.34	0.16	0.58	0.02	0.020	15.4	22.4	15	22
031	06 18 68	1600	15.2	6.3	0	24	438	606	1292	624	460	63.5	0.758	0.90	0.34	0.39	0.76	0.20	0.135	15.4	47.3	35	57
032	06 18 68	1800	16.3	6.9	0	2	540	750	1253	1240	428	109.0	0.083	0.43	0.47	0.34	0.70	0.09	0.240	15.4	34.4	32	59
033	06 18 68	2100	15.7	6.9	0	2	384	540	1004	1036	468	172.0	0.124	0.28	0.50	0.54	1.14	0.15	0.180	20.9	29.7	38	61
034	06 19 68	0300	11.0	7.0	0	0	321	396	944	412	284	81.5	0.040	0.04	0.24	0.16	0.78	0.04	0.155	14.6	22.1	13	25
035	06 19 68	0600	9.1	7.1	2	0	372	576	1310	436	328	59.5	0.024	0.98	0.14	0.12	0.66	0.02	0.070	17.4	56.3	18	43
036	06 19 68	0900	13.2	6.2	0	36	411	501	944	408	256	77.5	0.150	0.14	0.22	0.19	0.90	0.06	0.240	13.4	23.8	16	29
037	06 19 68	1400	17.2	7.0	0	0	420	510	914	412	344	85.5	0.019	0.00*	0.50	0.40	0.88	0.09	0.200	20.7	33.6	22	57
038	06 19 68	1900	15.8	7.0	0	0	270	555	1314	1820	776	165.0	0.034	0.10	0.64	0.44	0.96	0.20	0.175	20.7	35.0	34	60
039	06 19 68	2100	15.7	7.0	0	0	456	624	1545	2492	604	134.0	0.058	0.00*	0.50	0.48	1.00	0.08	0.215	20.7	35.0	45	81
040	06 20 68	0100	13.8	7.1	2	0	390	615	1430	856	568	63.5	0.000*	0.02	0.29	0.20	0.92	0.06	0.195	30.8	46.8	22	38
041	06 20 68	0500	9.2	7.0	0	0	1440	1950	2784	1316	468	286.0	0.014	0.00*	0.22	0.18	0.44	0.02	0.060	19.6	25.4	25	50
042	06 20 68	1100	15.5	7.0	0	0	282	438	705	320	136	65.0	0.019	0.04	0.64	0.10	0.80	0.10	0.030	16.8	13.7	14	34

*=NO ANALYSIS

[1]Total oil and grease

Table 1

Summary of Estimated Industrial Waste Characteristics
Extended Ley Creek Sanitary District

Company	Products or Services	Number of Employees	Water Use gal/day	Plant Effluent gal/day	Discharge to Ley Creek S.T.P. Sanitary gal/day	Discharge to Ley Creek S.T.P. Industrial gal/day	Discharge to Ley Creek Industrial gal/day	Major Contaminants, lbs/day BOD	SS	pH Range	oil grease	CN	Cr	Cd	Ni	Cu	Zn	Potential Clean Water Segregation gal.	Remarks
Acorn Tool Co.	Repairs air conditioners	2	20	20	20	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Advanced Welding Co.	Welded metal products	3	40	40	-	-	-	1[1]	1[1]	6-9	-	-	-	-	-	-	-	-	
Airco Plating Co.	Electroplated metals	4	100,000	100,000	80	100,000	-	10	6	2.4-6.5	-	11.5	2.5	12.0	0.7	4.6	2.3	-	On septic tank system
Air-Pro Co.	Metal and plastic prototype units	3	30	30	30	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Algeo Manufacturing Co.	Machining and anodizing metals	17	1,400	1,400	-	-	-	2	2	-	-	-	<1	-	-	-	<1	-	Combined with Miller Electroplating and Anodizing Co.; discharge to Metropolitan S.T.P.
Allied Tool Corp.	Machined metal parts	19	190	190	-	-	-	2[1]	2[1]	6-9	-	-	-	-	-	-	-	-	On septic tank system
Barnes and Cone, Inc.	Masonry building blocks	22	10,000	220	-	-	-	3[1]	3[1]	6-9	-	-	-	-	-	-	-	-	Sanitary wastewater to septic tank, water used in product.
Beehner, Ray F. and Co.	Wooden church furniture	8	80	80	80	-	-	2	2	6-9	-	-	-	-	-	-	-	-	
Bliss Steel Co.	Fabricates window sash	25	4,400	4,400	250	4,150	-	5	5	6-9	-	-	-	-	-	-	-	-	
Bonac, Inc.	Electronic control panels	14	140	140	-	-	-	2[1]	2[1]	6-9	-	-	-	-	-	-	-	-	
Borden Co.	Ice cream	67	77,000	63,000	1,000	62,000	-	25	10	6-9	<10	-	-	-	-	-	-	-	On septic tank system
Bristol Laboratories	Antibiotics	1,960	2,200,000	1,890,000	40,000	1,827,000	23,000	29,086	47,486	2.0-12.0	-	-	-	-	-	-	-	yes	Volume of clean water not determined
Burkhard Brothers, Inc.	Rebuilds machinery	46	800	800	650	-	-	5	5	6-9	-	-	-	-	-	-	-	-	Process water to subsurface disposal
Burnett Processes, Inc.	Filters	75	750	750	750	-	-	8	8	6-9	-	-	-	-	-	-	-	-	
Burroughs, F. C. and Son	Metal polishing and buffing	1	10	10	10	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Canada Dry Bottling Co.	Soft drinks	15	53,500	16,000	150	15,850	-	90	50	6-11	-	-	-	-	-	-	-	-	Water used in product
Carrier Corp.	Air conditioning and refrigeration equipment	6,000	1,600,000	1,600,000	120,000	384,000	not measured	300	650	2.0-7.0	-	-	3.5	-	-	1.0	11.4	-	Approximately 800,000 gpd unaccounted for
Cast-O-Matic Corp.	Aluminum and zinc die castings	70	3,500	3,500	1,400	2,100	-	8	8	6-9	-	-	-	-	-	-	-	2,100	
Chrysler Corp.	Automotive transmissions	1,520	240,000	220,000	30,000	150,000	40,000	250	260	4.0-8.0	190	-	-	-	-	-	-	40,000	Increasing size of facilities and installing new treatment plant
Cliequot Club Bottling Co.	Soft drinks	7	7,900	2,400	-	-	2,300	20[1]	10[1]	6-11	-	-	-	-	-	-	-	-	Sanitary wastewater to septic tank; industrial to creek; water used in product
Colucci, T. A. Printing Co.	Printed forms	20	500	500	400	100	-	2	2	6-9	-	-	-	-	-	-	-	100	
Continental Can Co.	Corrugated containers	140	22,000	22,000	1,400	-	20,600	15	15	6-9	-	-	-	-	-	-	<10	11,000	Cooling and process wastewater to Ley Creek
Cook, E. F. Co.	Machined metal parts	5	50	50	-	-	-	1[1]	1[1]	6-9	-	-	-	-	-	-	-	-	On septic tank system
Corenco	Renders fat, bones, etc.	58	131,000	131,000	600	130,400	-	650	400	5.6-7.0	200	-	-	-	-	-	-	-	
Crispy Maid Potato Chip Co.	Potato chips	11	8,100	8,100	200	7,900	-	60	160	6.3-7.0	-	-	-	-	-	-	-	-	
Crouse Hinds	Illuminating fixtures	2,500	750,000	705,000	5,000	-	745,000	50	600[1]	2.0-7.0	450[1]	2.7[1]	3.0[1]	2.7[1]	0.1[1]	1.3[1]	80.5[1]	yes	Volume of clean water not determined; process wastewater and cooling water to stream
Curry, McLaughlin and Len, Inc.	Electronic instruments	25	270	270	250	-	20	3	3	6-9	-	-	-	-	-	<1	<1	-	
Custom Sheet Metal Corp.	Sheet metal	5	50	50	50	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Dairymen's League Cooperative Association	Milk and milk products	50	100,000	95,000	-	-	-	750[1]	1,250[1]	6-11	-	-	-	-	-	-	-	26,000	Wastewater to Metropolitan S.T.P.
DeLima, Paul Co., Inc.	Roasted coffee	14	1,000	950	150	800	-	2	2	6-9	-	-	-	-	-	-	-	800	
Eagle Metalcraft	Aluminum products	19	10,500	10,500	200	10,300	-	5	33	6.3-8.5	-	-	0.03	-	-	-	-	800	
Fairbanks Dairies	Bottled milk distribution	13	4,200	4,200	130	4,070	-	20	20	6-9	-	-	-	-	-	-	-	2,500	No processing or bottling
Fairmont Chemical Co.		1	10	10	10	-	-	1	1	6-9	-	-	-	-	-	-	-	-	Out of business
Falso Industries, Inc.	Fabricated metal	25	2,800	2,800	850	1,950	-	3	3	6-9	-	-	-	-	-	-	-	1,950	
Franklin Engine Co.	Aircraft engines	155	70,000	70,000	1,500	-	68,500	20	20	6-9	-	-	-	-	-	-	-	-	Process wastewater to Bloody Brook
Frey's Pattern Shop	Patterns and castings	3	65	65	-	-	-	1[1]	1[1]	6-9	-	-	-	-	-	-	-	-	On septic tank system
Friedel, J. F. Paper Box Co.	Paper boxes	55	930	950	900	30	-	10	10	6-9	-	-	-	-	-	-	-	-	
Gaebel Enterprises Inc.	Metal rulers and scales	8	200	200	160	40	-	1	1	4-9	-	-	-	-	-	-	-	-	
Gardall Corp.	Safes	14	1,250	1,250	250	1,000	-	2	2	6-9	-	-	-	-	-	-	-	1,000	
G. E. - Court Street	Military electronics	2,500	-	200,000	50,000	150,000	-	300	300	6.0-8.2	-	5.9	1.1	0.7	1.0	0.3	0.3	-	
G. E. - Electronics Park	Semi-conductors and TV tubes	-	1,760,000	1,760,000	20,000	1,540,000	200,000	221	400	2.0-6.2	98.8	-	0.23	0.86	0.21	26.7	3.6	-	
General Motors Corp.	Automotive hardware	1,550	1,500,000	1,500,000	30,000	-	1,470,000	200	156	6.1-7.9	-	-	10.6[1]	-	9.9[1]	4.1[1]	7.1[1]	-	
General Super Plating	Electroplates metals	65	140,000	140,000	1,000	139,000	-	20	40	2.6-8.6	-	13.8	14.3	3.2	22.6	4.7	3.3	-	
Green's Paste Works	Adhesive paste	1	300	250	20	230	-	2	2	6-9	-	-	-	-	-	-	-	230	
Hoffman Industries	Blowers, vacuum and filtration equipment	107	38,000	18,100	1,100	17,000	-	12	12	6-9	-	-	-	-	-	-	<1	5,000	Discrepancy between meter reading and estimated effluent flow
Industrial Fabricating Corp.	Metal fabrication	30	800	800	300	-	500	5	5	6-9	-	-	-	-	-	-	-	-	
Iroquois Door Co.	Doors and wood products	50	500	500	-	-	-	6[1]	6[1]	6-9	-	-	-	-	-	-	-	-	Sanitary to septic tank
Jessel Marking Equipment Co.	Rubber stamps	11	310	310	110	-	200	2	2	6-9	-	-	-	-	-	-	-	-	Cooling water to ground
Jones, W. C. Machine Products Co.	screw machine products	7	150	150	150	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Kilian Manufacturing Co.	Ball bearing rings	325	14,500	14,500	-	-	-	35[1]	35[1]	4-10	<2[1]	<5[1]	-	-	-	-	-	-	Effluent to Metropolitan S.T.P.
Lawson Div. - Diebold, Inc.	Air tube systems	600	6,800	6,800	6,000	800	-	75	75	6-9	-	-	-	-	-	-	-	-	
Lemoyne Machine Products Corp.	Machined metals	4	40	40	40	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Lennox Industries, Inc.	Heating and air conditioning units	275	47,000	42,300	2,800	39,500	-	40	50	6-9	-	-	-	-	-	-	<5	36,000	Clean water from number of sources
Liberty Combustion Corp.	Combustion equipment	8	1,100	1,100	80	-	1,020	1	1	6-9	-	-	-	-	-	-	<5	-	Contaminated wastewater should be added to sewer
Lis Brothers	Metal stampings	3	30	30	30	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
Mark's Machine and Tool Corp.	Machined metal	52	1,400	1,400	1,000	-	400	6	6	6-9	-	-	-	-	-	-	-	-	
Mastech, Inc.	Electronic testing equipment	50	500	500	500	-	-	5	5	6-9	-	-	-	-	-	-	-	-	
Mathews Lumber Co., Inc.	Lumber and building supplies	6	60	60	60	-	-	1	1	6-9	-	-	-	-	-	-	-	-	
McIntosh Box and Lumber Co., Inc.	Wooden boxes	13	130	130	130	-	-	2	2	6-9	-	-	-	-	-	-	-	-	
Nelson Foundries, Inc.	Aluminum and bronze castings	36	2,400	700	700	-	-	4	4	6-9	-	-	-	-	-	-	-	-	Water used to moisten sand
Metal Finishing Supply, Inc.	Coated plating racks	7	1,250	1,250	70	1,180	-	1	1	6-9	-	-	-	-	-	-	-	1,180	
Morse Manufacturing Co., Inc.	Barrel handling equipment	16	160	160	160	-	-	2	2	6-9	-	-	-	-	-	-	-	-	
Mutual Library Bindery	Binds books, magazines, etc.	29	300	300	300	-	-	5	3	6-9	-	-	-	-	-	-	-	-	
National Plating Co.	Electroplates metals	20	31,000	31,000	200	30,800	-	5	10	2.5-8.6	-	1.6	1.0	0.4	1.2	0.4	0.6	-	

Table 2

Bristol Laboratories

Summary of Wastewater Characteristic

Parameter	MH-1			MH-2			MH-3			MH-4			MH-5			MH-7			MH-9			Mean	Median
	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range	Mean	Median	Range		
Flow, mgd	.168	0.06	.02-2.4	0.014	0.014	0.014	1.24	1.22	.61-2.29	0.019[1]	0.019	0.007-.288	.165	.159	0.03-0.30	.265	.259	.209-.338	0.023	0.01	0.007-0.158	1.89	1.74
BOD_5 mg/l	109	39	3-432	-	-	-	2,754	2,490	756-9,600	130	90	24-276	299	234	3-696	-	-	-	-	-	-	3,292	2,853
lbs/day	270	33	1-4,494	-	-	-	28,277	23,161	6,602-97,563	27	6	4-71	511	455	1-1,394	-	-	-	-	-	-	29,085	23,655
BODult, mg/l	176	114	9-906	-	-	-	4,472	4,410	1,164-13,800	148	132	31-282	410	282	9-888	-	-	-	-	-	-	5,206	4,938
lbs/day	406	69	3-5,992	-	-	-	45,999	45,774	10,479-120,177	29	8	5-73	692	719	2-1,623	-	-	-	-	-	-	47,126	46,570
COD, mg/l	281	103	0-1,832	11	9	5-28	5,581	5,455	1,475-15,180	194[1]	288	93-2,392	675[1]	636	19-3,630	268	122	10-1,272	185	94	19-1,084	7,195	6,707
lbs/day	699	89	0-13,441	1	1	0-3	57,592	59,000	13,989-139,011	31[2]	23	15-5,738	991[1]	1,194	5-5,138	596	234	21-2,777	22	11	2-104	59,930	60,552
pH	-	6.8	2.4->11.0	-	7.0	6.0-7.2	-	6.0	2.0-12.0	-	6.3	3.3-6.6	-	7.7	6.2-9.7	-	7.0	6.4-7.2	-	6.8	6.2-7.5	-	-
Acidity, mg/l	9	0	0-186	0	0	4-8	98	60	0-1,100	106	20	20-420	2	0	0-20	1	0	0-6	3	2	0-8	219	82
lbs/day	27	0	0-906	0	0	0-1	1,119	773	0-11,268	14	10	3-26	3	0	0-27	1	0	0-6	0	0	0-1	1,164	783
Alkalinity, mg/l	26	0	0-230	0	0	0	163	0	0-5,260	0	0	0	38	10	0-104	0	0	0	0	0	0	227	10
lbs/day	54	0	0-1,118	0	0	0	2,946	0	0-100,321	0	0	0	45	8	0-138	0	0	0	0	0	0	3,045	8
SS, mg/l	201	74	4-2,408	19	20	4-34	4,120	3,048	132-33,030	79[1]	54	44-264	114	66	12-316	21	16	8-36	48	39	16-164	4,602	3,317
lbs/day	1,351	59	6-48,093	2	2	0-4	45,871	34,802	1,343-374,806	16[1]	9	3-633	189	55	17-633	47	45	17-76	10	4	1-66	47,486	34,976
VSS, mg/l	70	41	0-812	11	14	4-14	1,362	1,280	44-4,940	48[1]	44	8-242	57	19	0-230	11	16	0-18	28	29	14-48	1,587	1,443
lbs/day	167	20	0-4,953	1	2	0-2	13,914	13,844	448-56,056	10[1]	7	1-581	109	10	0-582	24	31	0-43	6	3	1-26	14,231	13,917
NH_3-N, mg/l	2.7	1.4	0-26.6	0.7	0.1	0.1-3.4	29.9	21.0	0.1-132	3.9	4.2	3.4-4.2	10.6	11.3	0.1-21.8	0.1	-	0.0	0.7	0.1	0.1-2.0	48.6	38.1
lbs/day	2.0	0.9	0-20.5	0.1	0.0	0.0-0.4	306.7	204.9	0.9-1,412.7	0.6	0.6	0.2-0.8	9.6	4.3	0.1-29.8	0.2	-	0.2	0.0	0.1	0.0-0.1	319.2	210.8
TON[2], mg/l	8.5	4.2	0.1-68.0	0.7	0.8	0.1-1.4	106	102.5	0.1-271	40.4	17.3	12.1-91.8	16.5	12.3	3.6-52.0	1.5	1.9	.01-2.2	3.8	1.7	0.1-13.4	177.4	140.7
lbs/day	9.1	2.0	0.0-98.3	0.0	0.1	0.0-0.1	1,070.3	711.9	1.0-2,727.3	6.6	4.4	0.7-14.6	33.2	12.1	4.6-104.1	3.5	4.4	0.2-5.1	0.6	0.2	0.0-1.8	1,123.3	735.1
O-PO_4, mg/l	8.7	4.0	0.3-53.5	0.1	0.1	0.1-0.2	53.1	35.5	2.2-300.0	110	-	one sample	17.1	17.5	1.0-29.0	5.7	5.2	5.0-7.5	4.6	5.4	0.2-11.0	199.3	67.7
lbs/day	17.5	3.5	0.1-279.6	0.0	0.0	0.0-0.0	520.2	382.6	19.2-3,580.5	28.3	-	one sample	17.5	18.7	1.3-31.4	12.5	12.3	10.9-14.8	0.4	0.4	0.0-0.9	596.4	417.5
T-PO_4, mg/l	17.4	7.0	0.8-190	0.8	0.8	0.1-1.6	82.6	56.5	5.1-350.0	157	-	one sample	24.0	20.5	4.0-47.0	8.9	8.5	7.5-11.2	7.1	7.0	2.0-15.0	297.8	100.3
lbs/day	29.5	5.2	0.2-449	0.1	0.1	0.0-0.2	807.2	536.6	44.5-4,177.3	40.5	-	one sample	21.9	23.3	5.3-35.5	19.7	18.0	17.2-25.9	1.1	0.8	0.2-2.6	920.0	584.0

[1]Grab samples removed from statistical analysis

[2]Total Organic Nitrogen

TABLE LC-2

THIS TABULATION IS THE RANKED RAW DATA
FLOW IS IN MILLION GALLONS PER DAY

RANDOM GRAB SURVEY - INFLUENT

ID	PLOT FLOW		PLOT PH		PLOT ALK		PLOT ACID		PLOT BOD-5		PLOT BOD UC		PLOT COD		PLOT SS		PLOT VSS		PLOT OIL		PLOT CN-		PLOT PHENOL		PLOT TOT CR		PLOT COPPER		PLOT ZINC		PLOT CADM		PLOT NICKEL		PLOT NH3-N		PLOT ORG-N		PLOT PO4-D		PLOT PO4TOT	
001	0.023	8.7	0.023	6.0	0.023	0	0.023	0	0.023	177	0.023	212	0.023	329	0.023	20	0.024	72	0.023	24.4	0.031	0.001	0.026	0.01	0.023	0.12	0.023	0.10	0.023	0.17	0.023	0.02	0.031	0.020	0.023	7.8	0.023	10.6	0.023	8	0.023	15
002	0.047	9.1	0.047	6.2	0.047	0	0.047	0	0.047	190	0.047	240	0.047	368	0.047	80	0.048	76	0.047	37.2	0.062	0.001	0.053	0.01	0.047	0.12	0.047	0.10	0.047	0.22	0.047	0.02	0.062	0.020	0.047	9.6	0.047	11.2	0.047	9	0.047	15
003	0.070	9.2	0.070	6.2	0.070	0	0.070	0	0.070	192	0.070	249	0.070	423	0.070	148	0.071	124	0.070	41.5	0.094	0.001	0.079	0.02	0.070	0.14	0.070	0.10	0.070	0.25	0.070	0.02	0.094	0.030	0.070	9.8	0.070	13.7	0.070	10	0.070	17
004	0.093	9.6	0.093	6.3	0.093	0	0.093	0	0.093	198	0.093	270	0.093	432	0.093	164	0.095	136	0.093	45.0	0.125	0.001	0.105	0.04	0.093	0.14	0.093	0.12	0.093	0.31	0.093	0.02	0.125	0.040	0.093	10.4	0.093	14.7	0.093	10	0.093	22
005	0.116	9.7	0.116	6.3	0.116	0	0.116	0	0.116	210	0.116	276	0.116	462	0.116	252	0.119	140	0.116	46.5	0.156	0.001	0.132	0.04	0.116	0.14	0.116	0.12	0.116	0.39	0.116	0.02	0.156	0.045	0.116	10.7	0.116	18.2	0.116	13	0.116	22
006	0.140	10.2	0.140	6.4	0.140	0	0.140	0	0.140	255	0.140	288	0.140	500	0.140	256	0.143	140	0.140	52.5	0.187	0.001	0.158	0.04	0.140	0.14	0.140	0.14	0.140	0.42	0.140	0.02	0.187	0.060	0.140	11.0	0.140	20.9	0.140	13	0.140	25
007	0.163	10.2	0.163	6.5	0.163	0	0.163	0	0.163	260	0.163	396	0.163	597	0.163	276	0.167	164	0.163	53.5	0.219	0.002	0.184	0.06	0.163	0.15	0.163	0.14	0.163	0.44	0.163	0.02	0.219	0.060	0.163	11.3	0.163	21.2	0.163	14	0.163	25
008	0.186	10.4	0.186	6.5	0.186	0	0.186	0	0.186	270	0.186	396	0.186	696	0.186	312	0.190	180	0.186	54.2	0.250	0.002	0.211	0.07	0.186	0.15	0.186	0.14	0.186	0.44	0.186	0.02	0.250	0.070	0.186	11.9	0.186	21.8	0.186	15	0.186	29
009	0.209	10.5	0.209	6.6	0.209	0	0.209	0	0.209	270	0.209	399	0.209	705	0.209	320	0.214	200	0.209	59.5	0.281	0.002	0.237	0.10	0.209	0.15	0.209	0.16	0.209	0.47	0.209	0.02	0.281	0.080	0.209	11.9	0.209	21.8	0.209	15	0.209	34
010	0.233	11.0	0.233	6.7	0.233	0	0.233	0	0.233	276	0.233	417	0.233	720	0.233	326	0.238	216	0.233	62.0	0.312	0.003	0.263	0.11	0.233	0.15	0.233	0.16	0.233	0.50	0.233	0.02	0.312	0.115	0.233	12.6	0.233	22.1	0.233	15	0.233	35
011	0.256	11.0	0.256	6.8	0.256	0	0.256	0	0.256	282	0.256	420	0.256	731	0.256	332	0.262	216	0.256	62.5	0.344	0.003	0.289	0.12	0.256	0.15	0.256	0.16	0.256	0.50	0.256	0.02	0.344	0.115	0.256	13.2	0.256	22.4	0.256	16	0.256	38
012	0.279	12.3	0.279	6.8	0.279	0	0.279	0	0.279	288	0.279	438	0.279	770	0.279	360	0.286	220	0.279	63.0	0.375	0.009	0.316	0.13	0.279	0.19	0.279	0.16	0.279	0.56	0.279	0.02	0.375	0.120	0.279	13.4	0.279	22.4	0.279	18	0.279	40
013	0.302	12.8	0.302	6.8	0.302	0	0.302	0	0.302	321	0.302	468	0.302	792	0.302	376	0.310	224	0.302	63.5	0.406	0.010	0.342	0.14	0.302	0.20	0.302	0.18	0.302	0.58	0.302	0.03	0.406	0.125	0.302	13.4	0.302	23.0	0.302	19	0.302	40
014	0.326	13.0	0.326	6.9	0.326	0	0.326	0	0.326	330	0.326	477	0.326	800	0.326	408	0.333	224	0.326	63.5	0.437	0.014	0.368	0.15	0.326	0.20	0.326	0.18	0.326	0.58	0.326	0.03	0.437	0.135	0.326	13.7	0.326	23.4	0.326	20	0.326	40
015	0.349	13.0	0.349	6.9	0.349	0	0.349	0	0.349	336	0.349	501	0.349	800	0.349	412	0.357	228	0.349	64.5	0.468	0.018	0.395	0.15	0.349	0.22	0.349	0.19	0.349	0.66	0.349	0.03	0.469	0.135	0.349	14.6	0.349	23.8	0.349	20	0.349	43
016	0.372	13.0	0.372	6.9	0.372	0	0.372	0	0.372	342	0.372	510	0.372	838	0.372	412	0.381	232	0.372	65.0	0.500	0.019	0.421	0.15	0.372	0.22	0.372	0.20	0.372	0.68	0.372	0.04	0.500	0.145	0.372	14.6	0.372	23.9	0.372	20	0.372	45
017	0.395	13.2	0.395	7.0	0.395	0	0.395	0	0.395	360	0.395	528	0.395	893	0.395	420	0.405	232	0.395	66.0	0.531	0.019	0.447	0.15	0.395	0.22	0.395	0.20	0.395	0.69	0.395	0.04	0.531	0.150	0.395	14.8	0.395	24.2	0.395	20	0.395	45
018	0.419	13.2	0.419	7.0	0.419	0	0.419	0	0.419	372	0.419	530	0.419	904	0.419	420	0.429	248	0.419	70.0	0.562	0.024	0.474	0.16	0.419	0.22	0.419	0.21	0.419	0.70	0.419	0.04	0.562	0.150	0.419	15.1	0.419	25.2	0.419	22	0.419	45
019	0.442	13.3	0.442	7.0	0.442	0	0.442	0	0.442	372	0.442	540	0.442	914	0.442	436	0.452	252	0.442	70.5	0.594	0.024	0.500	0.17	0.442	0.22	0.442	0.22	0.442	0.70	0.442	0.04	0.594	0.150	0.442	15.4	0.442	25.4	0.442	22	0.442	46
020	0.465	13.3	0.465	7.0	0.465	0	0.465	0	0.465	384	0.465	552	0.465	936	0.465	448	0.476	256	0.465	74.0	0.625	0.024	0.526	0.19	0.465	0.23	0.465	0.23	0.465	0.74	0.465	0.05	0.625	0.155	0.465	15.4	0.465	26.0	0.465	24	0.465	50
021	0.488	13.8	0.488	7.0	0.488	0	0.488	0	0.488	388	0.488	553	0.488	944	0.488	456	0.500	260	0.488	77.5	0.656	0.034	0.553	0.19	0.488	0.24	0.488	0.25	0.488	0.74	0.488	0.05	0.656	0.175	0.488	15.4	0.488	26.3	0.488	25	0.488	50
022	0.512	14.2	0.512	7.0	0.512	0	0.512	0	0.512	390	0.512	565	0.512	944	0.512	456	0.524	264	0.512	81.5	0.687	0.049	0.579	0.20	0.512	0.27	0.512	0.26	0.512	0.74	0.512	0.05	0.687	0.175	0.512	15.4	0.512	26.6	0.512	25	0.512	57
023	0.535	14.3	0.535	7.0	0.535	0	0.535	0	0.535	396	0.535	576	0.535	995	0.535	464	0.548	268	0.535	83.0	0.719	0.058	0.605	0.20	0.535	0.27	0.535	0.28	0.535	0.76	0.535	0.05	0.719	0.180	0.535	15.7	0.535	26.8	0.535	25	0.535	57
024	0.558	15.0	0.558	7.0	0.558	0	0.558	0	0.558	411	0.558	600	0.558	1000	0.558	468	0.571	284	0.558	84.0	0.750	0.083	0.632	0.24	0.558	0.29	0.558	0.29	0.558	0.76	0.558	0.06	0.750	0.185	0.558	15.7	0.558	27.7	0.558	26	0.558	59
025	0.581	15.0	0.581	7.0	0.581	0	0.581	0	0.581	420	0.581	606	0.581	1004	0.581	500	0.595	320	0.581	85.5	0.781	0.092	0.658	0.26	0.581	0.34	0.581	0.34	0.581	0.78	0.581	0.06	0.781	0.190	0.581	16.5	0.581	27.8	0.581	27	0.581	60
026	0.605	15.2	0.605	7.0	0.605	0	0.605	0	0.605	432	0.605	612	0.605	1030	0.605	516	0.619	320	0.605	93.0	0.812	0.124	0.684	0.27	0.605	0.34	0.605	0.35	0.605	0.78	0.605	0.06	0.812	0.195	0.605	16.8	0.605	28.7	0.605	28	0.605	61
027	0.628	15.5	0.628	7.0	0.628	2	0.628	438	0.628	615	0.628	1065	0.628	586	0.643	328	0.628	93.5	0.844	0.150	0.711	0.28	0.628	0.34	0.628	0.36	0.628	0.78	0.628	0.06	0.844	0.200	0.628	16.8	0.628	29.4	0.628	28	0.628	63
028	0.651	15.6	0.651	7.0	0.651	0	0.651	2	0.651	444	0.651	624	0.651	1079	0.651	616	0.667	336	0.651	95.5	0.875	0.160	0.737	0.30	0.651	0.34	0.651	0.39	0.651	0.80	0.651	0.08	0.875	0.215	0.651	17.4	0.651	29.7	0.651	31	0.651	65
029	0.674	15.6	0.674	7.0	0.674	0	0.674	2	0.674	450	0.674	660	0.674	1150	0.674	624	0.690	336	0.674	98.5	0.906	0.184	0.763	0.31	0.674	0.36	0.674	0.39	0.674	0.88	0.674	0.08	0.906	0.240	0.674	17.8	0.674	31.9	0.674	32	0.674	65
030	0.698	15.6	0.698	7.0	0.698	0	0.698	4	0.698	456	0.698	690	0.698	1194	0.698	672	0.714	344	0.698	103.0	0.937	0.226	0.789	0.33	0.698	0.39	0.698	0.39	0.698	0.88	0.698	0.08	0.937	0.240	0.698	18.5	0.698	33.1	0.698	32	0.698	65
031	0.721	15.7	0.721	7.0	0.721	0	0.721	4	0.721	480	0.721	696	0.721	1220	0.721	724	0.738	360	0.721	103.0	0.969	0.758	0.816	0.43	0.721	0.43	0.721	0.40	0.721	0.88	0.721	0.09	0.969	0.265	0.721	18.5	0.721	33.6	0.721	33	0.721	65
032	0.744	15.7	0.744	7.1	0.744	2	0.744	4	0.744	510	0.744	750	0.744	1230	0.744	852	0.762	360	0.744	105.0	0.000	0.000*	0.842	0.47	0.744	0.46	0.744	0.40	0.744	0.90	0.744	0.09	0.000	0.000*	0.744	19.5	0.744	34.2	0.744	34	0.744	65
033	0.767	15.7	0.767	7.1	0.767	2	0.767	6	0.767	540	0.767	768	0.767	1248	0.767	856	0.786	428	0.767	109.0	0.000	0.000*	0.868	0.54	0.767	0.45	0.767	0.40	0.767	0.90	0.767	0.09	0.000	0.000*	0.767	19.6	0.767	34.4	0.767	35	0.767	65
034	0.791	15.7	0.791	7.1	0.791	2	0.791	16	0.791	567	0.791	810	0.791	1253	0.791	1016	0.810	432	0.791	126.0	0.000	0.000*	0.895	0.61	0.791	0.47	0.791	0.41	0.791	0.90	0.791	0.10	0.000	0.000*	0.791	20.7	0.791	35.0	0.791	35	0.791	70
035	0.814	15.8	0.814	7.1	0.814	2	0.814	20	0.814	600	0.814	816	0.814	1292	0.814	1024	0.833	460	0.814	134.0	0.000	0.000*	0.921	0.86	0.814	0.50	0.814	0.42	0.814	0.92	0.814	0.10	0.000	0.000*	0.814	20.7	0.814	35.0	0.814	35	0.814	70
036	0.837	16.3	0.837	7.4	0.837	28	0.837	22	0.837	648	0.837	864	0.837	1310	0.837	1036	0.857	468	0.837	139.0	0.000	0.000*	0.947	0.90	0.837	0.50	0.837	0.44	0.837	0.96	0.837	0.10	0.000	0.000*	0.837	20.7	0.837	35.0	0.837	36	0.837	70
037	0.860	17.2	0.860	7.4	0.860	28	0.860	24	0.860	684	0.860	864	0.860	1314	0.860	1232	0.881	468	0.860	142.0	0.000	0.000*	0.974	0.98	0.860	0.50	0.860	0.45	0.860	1.00	0.860	0.10	0.000	0.000*	0.860	20.9	0.860	38.4	0.860	38	0.860	70
038	0.884	17.3	0.884	7.4	0.884	28	0.884	24	0.884	696	0.884	900	0.884	1430	0.884	1240	0.905	568	0.884	144.0	0.000	0.000*	0.000	0.00*	0.884	0.52	0.884	0.48	0.884	1.06	0.884	0.13	0.000	0.000*	0.884	22.4	0.884	42.0	0.884	38	0.884	78
039	0.907	17.3	0.907	8.0	0.907	60	0.907	30	0.907	738	0.907	912	0.907	1545	0.907	1316	0.929	604	0.907	157.0	0.000	0.000*	0.000	0.00*	0.907	0.57	0.907	0.50	0.907	1.10	0.907	0.15	0.000	0.000*	0.907	24.6	0.907	45.5	0.907	40	0.907	81
040	0.930	18.0	0.930	8.0	0.930	62	0.930	36	0.930	1080	0.930	1410	0.930	2235	0.930	1820	0.952	776	0.930	165.0	0.000	0.000*	0.000	0.00*	0.930	0.64	0.930	0.50	0.930	1.34	0.930	0.20	0.000	0.000*	0.930	25.2	0.930	46.8	0.930	45	0.930	83
041	0.953	18.3	0.953	8.6	0.953	130	0.953	60	0.953	1440	0.953	1950	0.953	2735	0.953	2232	0.976	1312	0.953	172.0	0.000	0.000*	0.000	0.00*	0.953	0.64	0.953	0.54	0.953	1.50	0.953	0.20	0.000	0.000*	0.953	26.6	0.953	47.3	0.953	48	0.953	93
042	0.977	18.8	0.977	8.8	0.977	154	0.977	60	0.977	1620	0.977	2010	0.977	2784	0.977	2492	0.000	0*	0.977	286.0	0.000	0.000*	0.000	0.00*	0.977	1.38	0.977	0.62	0.977	1.41	0.977	0.31	0.000	0.000*	0.977	30.8	0.977	56.3	0.977	180	0.977	230
MEAN	13.7		7.0		12		8		465		642		1038		652		319		90.8		.067		.25		.32		.28		.72		.06		.134		16.3		28.2		29		55	
STD DEV	2.7		.5		33		15		299		379		529		534		215		47.5		.142		.24		.22		.14		.27		.06		.068		4.9		9.7		26		34	

*=NO ANALYSIS

TABLE LC-5

THIS TABULATION IS THE DATA EXTENDED TO POUNDS PER DAY
FLOW IS IN MILLION GALLONS PER DAY

RANDOM GRAB SURVEY - INFLUENT

ID	DATE	TIME	FLOW	PH	ALK	ACID	BOD-5	BOD UC	COD	SS	VSS	OIL	CN-	PHENOL	TOT CR	COPPER	ZINC	CADM	NICKEL	NH3-N	ORG-N	PO4-O	PO4T T
001	06 13 68	1500	18.8	7.4	4385	0	29755	33200	67653	43223	21925	11040.5	3.758	10.96	68.90	43.85	108.05	15.66	19.575	1503.4	4165.6	3915	7204
002	06 13 68	2000	15.6	6.5	0	2599	50420	68872	121631	76149	28069	10785.6	3.118	42.88	25.99	28.58	50.68	3.89	15.593	2533.9	3729.5	4548	8447
003	06 13 68	2100	15.7	6.6	0	2092	34003	73891	91024	80561	41350	12162.6	1.307	7.84	44.46	15.69	91.54	19.61	19.617	2053.2	3007.9	6277	9155
004	06 13 68	2400	14.3	7.4	3335	0	71471	96486	148660	121978	27636	18701.6	0.000*	23.82	32.16	41.69	81.00	5.95	13.698	1417.5	3097.1	4169	5956
005	06 14 68	0600	10.2	6.2	0	5098	38235	50980	67293	35686	19032	5352.8	0.764	0.00*	38.23	13.59	64.57	1.70	12.320	2260.1	3262.7	15294	19642
006	06 14 68	0800	13.3	6.3	0	3324	21936	30578	40770	16397	8420	5151.6	1.994	28.80	25.48	11.07	62.04	5.54	20.496	1085.7	1628.6	886	1383
007	06 14 68	1600	16.3	6.4	0	3354	56707	71341	109756	76219	48780	9451.2	24.390	16.76	59.45	76.22	112.80	15.24	22.865	2713.4	4237.8	4116	9909
008	06 14 68	1700	16.0	8.6	23091	0	49480	103459	149190	100760	53978	11095.5	27.589	80.96	77.96	62.97	110.95	11.99	17.243	2054.1	6822.2	4198	10496
009	06 14 68	2300	14.2	7.0	0	0	42583	65294	105629	29808	29808	16441.7	0.354	23.65	22.47	34.30	59.14	5.91	0.000*	1728.9	2767.9	2366	4731
010	06 15 68	0100	13.2	6.3	0	2639	47501	72571	92143	49260	29468	6872.2	0.329	34.08	16.49	42.88	63.77	10.99	0.000*	1302.4	2660.9	2639	4943
011	06 15 68	0400	10.2	7.0	0	0	48176	69332	97711	39424	18693	8369.1	0.085	12.74	10.19	16.99	42.48	3.39	12.745	960.1	1801.2	1105	3399
012	06 15 68	1200	15.6	7.0	0	0	37425	54578	77579	43143	29108	6822.2	11.955	19.49	19.49	32.48	183.22	5.19	5.847	1429.4	3417.6	3379	12085
013	06 15 68	1300	15.6	7.0	0	0	35086	51849	94992	46781	29628	5847.6	29.368	5.19	28.58	51.98	61.07	6.49	5.198	1923.2	4548.1	2599	10136
014	06 15 68	1600	13.3	6.0	0	6647	37225	52846	85307	28362	22158	5927.2	0.221	0.00*	16.61	39.88	99.71	2.21	2.215	864.1	1174.3	2105	9195
015	06 15 68	2100	15.0	6.9	0	250	202419	251149	341738	153938	44982	8746.5	0.125	16.24	18.74	49.98	112.45	3.74	0.000*	3073.7	5247.9	3998	7872
016	06 16 68	0200	10.5	6.7	0	525	94462	123326	195484	28514	21691	7347.0	0.175	14.87	19.24	15.74	68.22	1.75	5.248	1172.0	979.6	2711	3499
017	06 16 68	0700	12.8	7.1	213	0	27189	30708	49260	8530	7677	2601.6	0.000*	15.99	14.92	10.66	18.12	2.13	0.000*	1759.3	2324.4	1066	1599
018	06 16 68	1200	13.0	7.0	0	0	22741	25990	45807	17760	15161	4028.3	0.000*	20.57	15.16	15.16	23.82	2.16	0.000*	2728.9	3703.5	4332	7039
019	06 16 68	1500	13.0	8.0	6497	0	48081	66273	97894	49380	36385	5869.3	0.000*	29.23	12.99	24.90	33.57	2.16	0.000*	1429.4	3454.4	3032	7580
020	06 16 68	1900	13.0	6.8	0	433	51979	97461	133197	78402	36385	13644.5	0.000*	93.13	36.81	48.73	95.29	6.49	0.000*	1813.2	2999.6	3574	7039
021	06 16 68	2100	11.0	6.8	0	367	25290	36285	91630	93096	39584	9621.1	0.000*	0.91	39.40	56.81	97.12	8.24	0.000*	1695.1	2693.9	3482	5956
022	06 17 68	0300	8.7	8.8	9421	0	50440	55658	86530	61745	16813	6776.0	0.000*	10.87	10.87	11.59	18.11	2.17	0.000*	913.1	1579.8	1449	3261
023	06 17 68	0800	9.7	7.0	0	0	52359	69812	87184	180348	106011	11635.3	0.000*	0.80	16.16	16.96	35.55	1.61	0.000*	1244.3	1809.9	727	1778
024	06 17 68	1000	17.3	7.1	288	0	25507	38909	72054	65714	25940	9295.0	0.000*	27.38	38.91	56.20	112.40	5.76	0.000*	2666.0	3862.1	2162	9367
025	06 17 68	1300	17.3	7.0	0	0	57067	76089	115287	67443	38045	20463.4	0.144	67.73	198.87	72.05	126.81	11.52	38.188	2262.5	3011.8	2882	8485
026	06 17 68	1900	15.7	7.0	0	0	66698	91024	134704	67483	34003	13470.4	0.130	79.77	74.54	53.62	143.86	40.54	10.462	1974.3	3125.6	3270	4577
027	06 17 68	2200	15.0	7.0	0	0	42733	52104	99960	46981	26989	12869.8	0.125	29.98	44.98	32.48	92.46	7.49	23.740	1299.4	4135.8	4498	8746
028	06 18 68	0200	10.4	6.8	0	347	63934	74850	105691	36385	14208	8273.3	0.086	13.86	19.06	12.12	112.62	1.73	15.160	926.9	1576.7	1299	2166
029	06 18 68	0700	9.6	8.0	4958	0	15354	19912	26309	1599	0*	3318.6	0.160	23.99	11.19	11.19	33.58	1.60	10.795	1791.2	2015.2	800	1200
030	06 18 68	0900	12.3	7.4	2869	0	70082	93443	109119	31967	12705	6762.3	0.000*	12.29	34.83	16.39	59.42	2.05	2.049	1577.8	2295.0	1537	2254
031	06 18 68	1600	15.2	6.3	0	3039	55458	76729	163588	79008	58243	8040.1	95.975	113.95	43.05	49.38	96.22	25.32	17.093	1949.8	5988.9	4432	7217
032	06 18 68	1800	16.3	6.9	0	272	73321	101834	170131	168366	58113	14799.9	11.269	58.38	63.81	46.16	95.04	12.22	32.587	2091.0	4670.8	4345	8011
033	06 18 68	2100	15.7	6.9	0	262	50220	70622	131304	135489	61205	22494.3	16.216	36.61	65.39	70.62	149.09	19.61	23.540	2733.3	3884.2	4970	7978
034	06 19 68	0300	11.0	7.0	0	0	29413	36285	86499	37752	26023	7467.8	3.665	3.66	21.99	14.66	71.47	3.66	14.202	1337.8	2025.0	1191	2291
035	06 19 68	0600	9.1	7.1	152	0	28199	43662	99302	33050	24863	4510.2	1.819	74.28	10.61	9.09	50.03	1.51	5.306	1318.9	4267.7	1364	3260
036	06 19 68	0900	13.2	6.2	0	3958	45192	55088	103798	44862	28149	8521.5	16.493	15.39	24.19	20.89	98.96	8.59	26.389	1473.4	2616.9	1759	3189
037	06 19 68	1400	17.2	7.0	0	0	60176	73071	130954	59030	49287	12250.1	2.722	0.00*	71.63	57.31	126.08	12.89	28.655	2965.8	4814.0	3152	8167
038	06 19 68	1900	15.8	7.0	0	0	35536	73046	172941	239537	102132	21716.3	4.474	13.16	84.23	57.91	126.35	26.32	23.032	2724.4	4606.4	4475	7997
039	06 19 68	2100	15.7	7.0	0	0	59636	81607	202057	325906	78992	17524.6	7.585	0.00*	65.39	62.77	130.78	10.46	28.118	2707.1	4577.3	5985	10693
040	06 20 68	0100	13.8	7.1	230	0	44232	70697	164384	98401	65294	7299.5	0.000*	2.30	33.33	22.99	105.75	6.89	22.416	3540.5	5379.9	2529	4366
041	06 20 68	0500	9.2	7.0	0	0	110356	149440	213354	100853	35866	21917.8	1.073	0.00*	16.86	13.79	33.72	1.53	4.598	1502.0	1946.5	1316	3332
042	06 20 68	1100	15.5	7.0	0	0	36410	56552	91026	41317	17560	8392.4	2.453	5.16	82.63	12.91	103.29	12.91	3.873	2169.1	1768.3	1809	4890

*=NO ANALYSIS

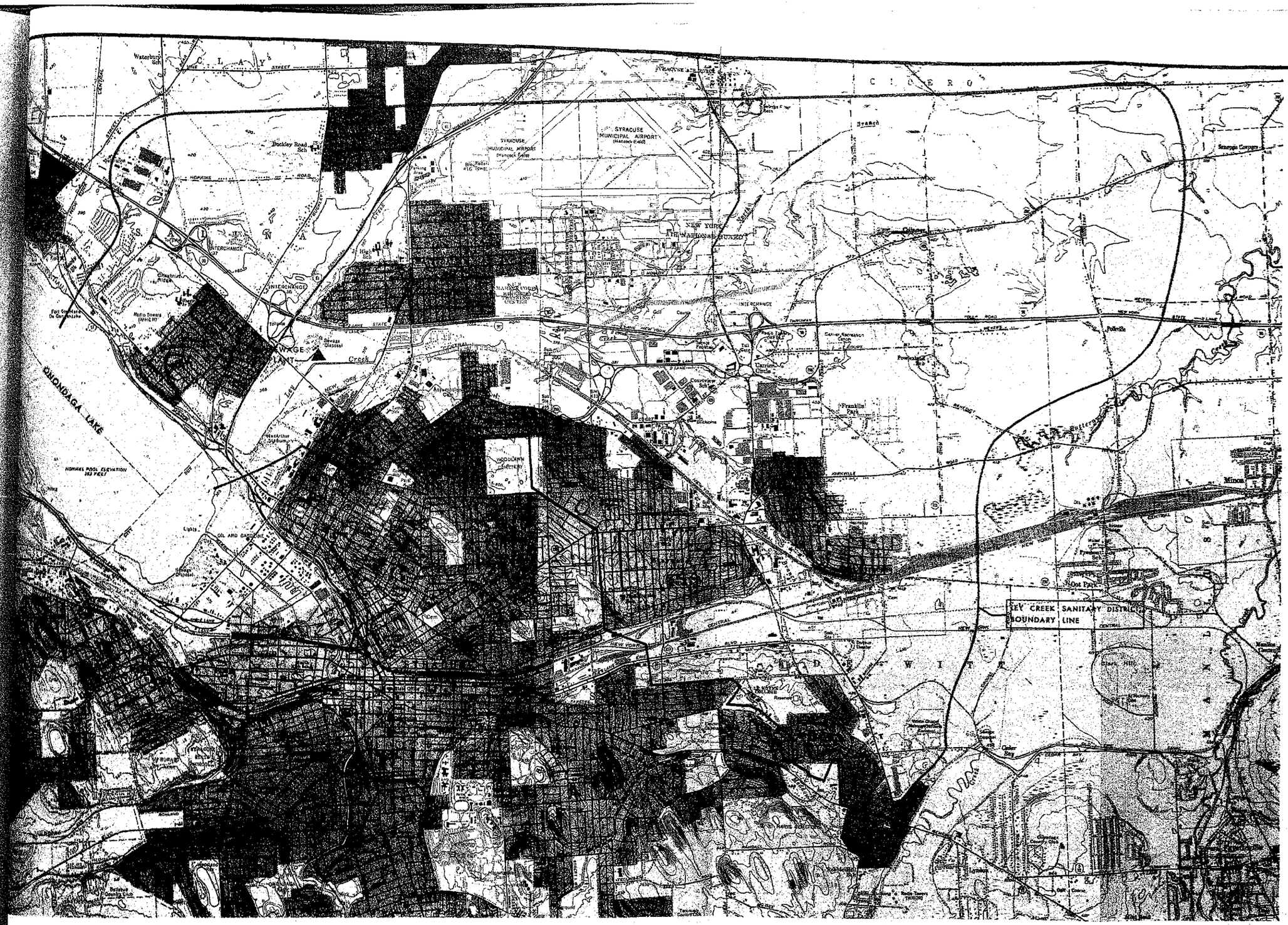
ABLE LC-1

THIS TABULATION IS THE RANKED EXTENDED DATA
FLOW IS IN MILLION GALLONS PER DAY

RANDOM GRAB SURVEY - INFLUENT

ID	PLOT FLOW		PLOT PH		PLOT ALK		PLOT ACID		PLOT BOD-5		PLOT BOD UC		PLOT COD		PLOT SS		PLOT VSS		PLOT OIL		PLOT CN-		PLOT PHENOL		PLOT TOT CR		PLOT COPPER		PLOT ZINC		PLOT CADM		PLOT NICKEL		PLOT NH3-N		PLOT ORG-N		PLOT PO4-D		PLOT PO4TOT	
001	0.023	8.7	0.023	6.0	0.023	0	0.023	0	0.023	15354	0.023	19912	0.023	26309	0.023	1599	0.024	7677	0.023	2601.6	0.03	0.085	0.026	0.80	0.023	10.19	0.023	9.09	0.023	18.11	0.023	1.51	0.031	2.049	0.023	864.1	0.023	979.6	0.023	727	0.023	1200
C	0.047	9.1	0.047	6.2	0.047	0	0.047	0	0.047	21936	0.047	25990	0.047	40770	0.047	8530	0.048	8420	0.047	3318.6	0.06	0.086	0.053	0.91	0.047	10.61	0.047	10.66	0.047	18.12	0.047	1.53	0.062	2.215	0.047	913.1	0.047	1174.3	0.047	800	0.047	1599
003	0.070	9.2	0.070	6.2	0.070	0	0.070	0	0.070	22741	0.070	30578	0.070	45807	0.070	16397	0.071	12705	0.070	4028.3	0.09	0.125	0.079	2.30	0.070	10.87	0.070	11.07	0.070	23.82	0.070	1.68	0.094	3.873	0.070	926.9	0.070	1576.7	0.070	886	0.070	1778
004	0.093	9.6	0.093	6.3	0.093	0	0.093	0	0.093	25290	0.093	30708	0.093	49260	0.093	17760	0.095	14208	0.093	4510.2	0.12	0.125	0.105	3.66	0.093	11.19	0.093	11.19	0.093	33.57	0.093	1.61	0.125	4.598	0.093	960.1	0.093	1579.8	0.093	1066	0.093	1883
005	0.116	9.7	0.116	6.3	0.116	0	0.116	0	0.116	25507	0.116	33200	0.116	67293	0.116	28362	0.119	15161	0.116	5151.6	0.15	0.130	0.132	5.16	0.116	12.99	0.116	11.59	0.116	33.58	0.116	1.70	0.156	5.198	0.116	1085.7	0.116	1628.6	0.116	1105	0.116	2166
006	0.140	10.2	0.140	6.4	0.140	0	0.140	0	0.140	27189	0.140	36285	0.140	67653	0.140	28514	0.143	16813	0.140	5352.8	0.18	0.144	0.158	5.19	0.140	14.92	0.140	12.12	0.140	33.72	0.140	1.73	0.187	5.248	0.140	1172.0	0.140	1768.8	0.140	1191	0.140	2254
007	0.163	10.2	0.163	6.5	0.163	0	0.163	0	0.163	28199	0.163	36285	0.163	72054	0.163	29808	0.167	17560	0.163	5847.6	0.21	0.160	0.184	7.84	0.163	15.16	0.163	12.91	0.163	35.55	0.163	1.75	0.219	5.306	0.163	1244.3	0.163	1801.2	0.163	1299	0.163	2291
008	0.186	10.4	0.186	6.5	0.186	0	0.186	0	0.186	29413	0.186	38909	0.186	77579	0.186	31967	0.190	18693	0.186	5869.3	0.25	0.175	0.211	10.87	0.186	16.16	0.186	13.59	0.186	42.48	0.186	2.05	0.250	5.847	0.186	1299.4	0.186	1809.9	0.186	1364	0.186	3189
009	0.209	10.5	0.209	6.6	0.209	0	0.209	0	0.209	29755	0.209	43662	0.209	85307	0.209	33050	0.214	19032	0.209	5927.2	0.28	0.221	0.237	10.96	0.209	16.49	0.209	13.79	0.209	50.03	0.209	2.13	0.281	10.462	0.209	1308.4	0.209	1946.5	0.209	1449	0.209	3260
010	0.233	11.0	0.233	6.7	0.233	0	0.233	0	0.233	34003	0.233	50980	0.233	86499	0.233	35686	0.238	21691	0.233	6762.3	0.31	0.329	0.263	12.29	0.233	16.61	0.233	14.66	0.233	50.68	0.233	2.16	0.312	10.795	0.233	1318.9	0.233	2015.2	0.233	1537	0.233	3261
011	0.256	11.0	0.256	6.8	0.256	0	0.256	0	0.256	35086	0.256	51849	0.256	86530	0.256	36385	0.262	21925	0.256	6776.0	0.34	0.354	0.289	12.74	0.256	16.86	0.256	15.16	0.256	59.14	0.256	2.16	0.344	12.320	0.256	1337.8	0.256	2025.0	0.256	1759	0.256	3399
012	0.279	12.3	0.279	6.8	0.279	0	0.279	0	0.279	35536	0.279	52104	0.279	87184	0.279	37752	0.286	22158	0.279	6822.2	0.37	0.764	0.316	13.16	0.279	18.74	0.279	15.69	0.279	59.42	0.279	2.17	0.375	12.745	0.279	1417.5	0.279	2295.0	0.279	1808	0.279	3499
013	0.302	12.8	0.302	6.8	0.302	0	0.302	0	0.302	36410	0.302	52846	0.302	91024	0.302	39424	0.310	24863	0.302	6872.2	0.40	1.073	0.342	13.86	0.302	19.06	0.302	15.74	0.302	61.07	0.302	2.21	0.406	13.698	0.302	1429.4	0.302	2324.4	0.302	1916	0.302	3832
014	0.326	13.0	0.326	6.9	0.326	0	0.326	0	0.326	37225	0.326	54578	0.326	91026	0.326	41317	0.333	25940	0.326	7299.5	0.43	1.307	0.368	14.87	0.326	19.24	0.326	16.39	0.326	62.04	0.326	3.39	0.437	14.202	0.326	1429.4	0.326	2616.9	0.326	2105	0.326	4368
015	0.349	13.0	0.349	6.9	0.349	0	0.349	0	0.349	37425	0.349	55088	0.349	91630	0.349	43163	0.357	26023	0.349	7347.0	0.46	1.819	0.395	15.39	0.349	19.49	0.349	16.96	0.349	63.77	0.349	3.66	0.469	15.160	0.349	1473.4	0.349	2660.9	0.349	2162	0.349	4390
016	0.372	13.0	0.372	6.9	0.372	0	0.372	0	0.372	38235	0.372	55658	0.372	92143	0.372	43223	0.381	26989	0.372	7467.8	0.50	1.994	0.421	15.99	0.372	21.99	0.372	16.99	0.372	64.57	0.372	3.74	0.500	15.593	0.372	1502.0	0.372	2693.9	0.372	2366	0.372	4577
017	0.395	13.2	0.395	7.0	0.395	0	0.395	0	0.395	42583	0.395	56552	0.395	94992	0.395	44862	0.405	27636	0.395	8040.1	0.53	2.453	0.447	16.24	0.395	22.47	0.395	20.89	0.395	68.22	0.395	3.89	0.531	17.093	0.395	1503.4	0.395	2767.9	0.395	2529	0.395	4731
018	0.419	13.2	0.419	7.0	0.419	0	0.419	0	0.419	42733	0.419	65294	0.419	97711	0.419	46781	0.429	28069	0.419	8273.3	0.56	2.722	0.474	16.76	0.419	24.19	0.419	22.99	0.419	71.47	0.419	5.19	0.562	17.243	0.419	1577.8	0.419	2999.6	0.419	2599	0.419	4948
019	0.442	13.3	0.442	7.0	0.442	0	0.442	0	0.442	44832	0.442	66273	0.442	97894	0.442	46981	0.452	28149	0.442	8369.1	0.59	3.118	0.500	19.49	0.442	25.48	0.442	24.90	0.442	81.00	0.442	5.54	0.594	19.575	0.442	1695.1	0.442	3007.9	0.442	2639	0.442	5956
020	0.465	13.3	0.465	7.0	0.465	0	0.465	0	0.465	45192	0.465	68872	0.465	99302	0.465	49260	0.476	29108	0.465	8392.4	0.62	3.665	0.526	20.57	0.465	25.99	0.465	28.58	0.465	91.54	0.465	5.76	0.625	19.617	0.465	1726.9	0.465	3011.8	0.465	2711	0.465	5956
021	0.488	13.8	0.488	7.0	0.488	0	0.488	0	0.488	47501	0.488	69332	0.488	99660	0.488	49380	0.500	29468	0.488	8521.5	0.65	3.758	0.553	23.65	0.488	28.58	0.488	32.48	0.488	92.46	0.488	5.91	0.656	20.496	0.488	1759.3	0.488	3097.1	0.488	2882	0.488	6485
022	0.512	14.2	0.512	7.0	0.512	0	0.512	0	0.512	48081	0.512	69812	0.512	103798	0.512	59030	0.524	29628	0.512	8746.5	0.68	4.474	0.579	23.82	0.512	32.16	0.512	32.48	0.512	95.04	0.512	5.95	0.687	22.416	0.512	1791.2	0.512	3125.6	0.512	3032	0.512	7039
023	0.535	14.3	0.535	7.0	0.535	0	0.535	0	0.535	48176	0.535	70622	0.535	105629	0.535	61745	0.548	29806	0.535	9295.0	0.71	7.585	0.605	23.99	0.535	33.33	0.535	34.30	0.535	95.29	0.535	6.49	0.719	22.865	0.535	1819.2	0.535	3262.7	0.535	3152	0.535	7039
024	0.558	15.0	0.558	7.0	0.558	0	0.558	0	0.558	49480	0.558	70697	0.558	105691	0.558	65714	0.571	34003	0.558	9451.2	0.75	11.269	0.632	27.38	0.558	34.83	0.558	39.86	0.558	96.22	0.558	6.49	0.750	23.032	0.558	1923.2	0.558	3417.6	0.558	3270	0.558	7204
0	0.581	15.0	0.581	7.0	0.581	0	0.581	0	0.581	50220	0.581	71341	0.581	109119	0.581	67443	0.595	35866	0.581	9621.1	0.78	11.955	0.658	28.80	0.581	36.81	0.581	41.69	0.581	97.12	0.581	6.59	0.781	23.540	0.581	1949.8	0.581	3454.4	0.581	3379	0.581	7217
026	0.605	15.2	0.605	7.0	0.605	0	0.605	0	0.605	50420	0.605	72571	0.605	109756	0.605	67483	0.619	36385	0.605	10785.6	0.81	16.216	0.684	29.23	0.605	38.23	0.605	42.88	0.605	98.96	0.605	6.89	0.812	23.740	0.605	1974.8	0.605	3703.5	0.605	3482	0.605	7580
027	0.628	15.5	0.628	7.0	0.628	0	0.628	250	0.628	50440	0.628	73046	0.628	115287	0.628	76149	0.643	36385	0.628	11040.5	0.84	16.493	0.711	29.98	0.628	38.91	0.628	43.85	0.628	99.71	0.628	7.49	0.844	26.389	0.628	2053.2	0.628	3729.5	0.628	3574	0.628	7872
028	0.651	15.6	0.651	7.0	0.651	0	0.651	262	0.651	51979	0.651	73071	0.651	121631	0.651	76219	0.667	38045	0.651	11095.5	0.87	24.390	0.737	34.08	0.651	39.40	0.651	46.16	0.651	103.29	0.651	8.24	0.875	28.118	0.651	2054.1	0.651	3862.1	0.651	3915	0.651	7897
029	0.674	15.6	0.674	7.0	0.674	0	0.674	272	0.674	52359	0.674	73891	0.674	130954	0.674	78402	0.690	39584	0.674	11635.3	0.90	27.589	0.763	36.61	0.674	43.05	0.674	48.73	0.674	105.75	0.674	10.46	0.906	28.655	0.674	2091.0	0.674	3884.2	0.674	3998	0.674	7978
030	0.698	15.6	0.698	7.0	0.698	0	0.698	347	0.698	55458	0.698	74850	0.698	131304	0.698	79008	0.714	41850	0.698	12162.6	0.93	29.368	0.789	42.88	0.698	44.46	0.698	49.38	0.698	108.05	0.698	10.99	0.937	32.587	0.698	2169.1	0.698	4135.8	0.698	4116	0.698	8011
031	0.721	15.7	0.721	7.0	0.721	0	0.721	367	0.721	56707	0.721	76089	0.721	133197	0.721	80561	0.738	44982	0.721	12250.1	0.96	95.975	0.816	58.38	0.721	44.98	0.721	49.98	0.721	110.95	0.721	11.52	0.969	38.188	0.721	2260.1	0.721	4165.6	0.721	4169	0.721	8167
032	0.744	15.7	0.744	7.1	0.744	152	0.744	433	0.744	57067	0.744	76729	0.744	134704	0.744	93096	0.762	48780	0.744	12869.8	0.000	0.000*	0.842	67.73	0.744	59.45	0.744	51.98	0.744	112.40	0.744	11.99	0.000	0.000*	0.744	2262.5	0.744	4237.8	0.744	4198	0.744	8447
033	0.767	15.7	0.767	7.1	0.767	213	0.767	525	0.767	59636	0.767	81607	0.767	148660	0.767	98401	0.786	49287	0.767	13470.4	0.000	0.000*	0.868	74.28	0.767	63.81	0.767	53.62	0.767	112.45	0.767	12.22	0.000	0.000*	0.767	2533.9	0.767	4267.7	0.767	4332	0.767	8746
034	0.791	15.7	0.791	7.1	0.791	230	0.791	2092	0.791	60176	0.791	91024	0.791	149190	0.791	100760	0.810	53978	0.791	13644.5	0.000	0.000*	0.895	79.77	0.791	65.39	0.791	56.20	0.791	113.62	0.791	12.89	0.000	0.000*	0.791	2656.0	0.791	4548.1	0.791	4345	0.791	9155
035	0.814	15.8	0.814	7.1	0.814	288	0.814	2599	0.814	63934	0.814	93443	0.814	163588	0.814	100853	0.833	58113	0.814	14799.9	0.000	0.000*	0.921	80.96	0.814	65.39	0.814	56.81	0.814	112.80	0.814	12.91	0.000	0.000*	0.814	2707.1	0.814	4577.3	0.814	4432	0.814	9195
036	0.837	16.3	0.837	7.4	0.837	2869	0.837	2639	0.837	66698	0.837	96486	0.837	164384	0.837	121978	0.857	58243	0.837	16441.7	0.000	0.000*	0.947	93.13	0.837	68.90	0.837	57.31	0.837	126.08	0.837	15.24	0.000	0.000*	0.837	2713.4	0.837	4606.4	0.837	4475	0.837	9367
037	0.860	17.2	0.860	7.4	0.860	3335	0.860	3039	0.860	70082	0.860	97461	0.860	170131	0.860	135489	0.881	61205	0.860	17524.6	0.000	0.000*	0.974	113.95	0.860	71.63	0.860	57.91	0.860	126.35	0.860	15.66	0.000	0.000*	0.860	2724.4	0.860	4670.8	0.860	4498	0.860	9909
038	0.884	17.3	0.884	7.4	0.884	4385	0.884	3324	0.884	71471	0.884	101834	0.884	172941	0.884	153938	0.905	65294	0.884	18701.6	0.000	0.000*	0.000	0.00*	0.884	74.54	0.884	62.77	0.884	126.81	0.884	13.61	0.000	0.000*	0.884	2728.9	0.884	4814.0	0.884	4548	0.884	10136
039	0.907	17.3	0.907	8.0	0.907	4958	0.907	3354	0.907	73321	0.907	103459	0.907	195484	0.907	168366	0.929	78992	0.907	20463.4	0.000	0.000*	0.000	0.00*	0.907	77.96	0.907	62.97	0.907	130.78	0.907	14.61	0.000	0.000*	0.907	2733.3	0.907	5247.9	0.907	4976	0.907	10496
040	0.930	18.0	0.930	8.0	0.930	6497	0.930	3958	0.930	94462	0.930	123326	0.930	202057	0.930	180348	0.952	102132	0.930	21716.3	0.000	0.000*	0.000	0.00*	0.930	82.63	0.930	70.62	0.930	143.86	0.930	25.32	0.000	0.000*	0.930	2965.8	0.930	5379.8	0.930	5885	0.930	10593
041	0.953	18.3	0.953	8.6	0.953	9421	0.953	5098	0.953	110356	0.953	149440	0.953	213354	0.953	239537	0.976	106011	0.953	21917.8	0.000	0.000*	0.000	0.00*	0.953	84.23	0.953	72.05	0.953	149.09	0.953	26.32	0.000	0.000*	0.953	3073.7	0.953	5988.9	0.953	6277	0.953	12085
042	0.977	18.8	0.977	8.8	0.977	23091	0.977	6647	0.977	202419	0.977	251149	0.977	341738	0.977	325906	0.000	0*	0.977	22494.3	0.000	0.000*	0.000	0.00*	0.977	198.87	0.977	76.22	0.977	183.22	0.977	40.54	0.000	0.000*	0.977	3540.5	0.977	6822.2	0.977	15294	0.977	19542
MEAN	13.7		7.0		1320		838		51073		71117		115965		74776		36362		10325.7		8.707		29.40		39.91		34.65		34.79		8.45		16.221		1873.3		3278.2		3244		6397	
STD DEV	2.7		.5		3995		1615		30559		38825		55755		63246		22399		5239.7		18.279		28.18		33.74		20.56		38.72		8.22		9.463		666.5		1356.7		2382		3597	

**=NO ANALYSIS



COMBINED LEY CREEK SANITARY DISTRICT
SYRACUSE, NEW YORK

SCALE IN MILES

ROY F. WESTON
WEST CHESTER PENNSYLVANIA

DRAWN	SCALE	DWG. NO.
JCA — DWS	AS SHOWN	B-1
DATE 12/23/68	W.O. NO. 33603	